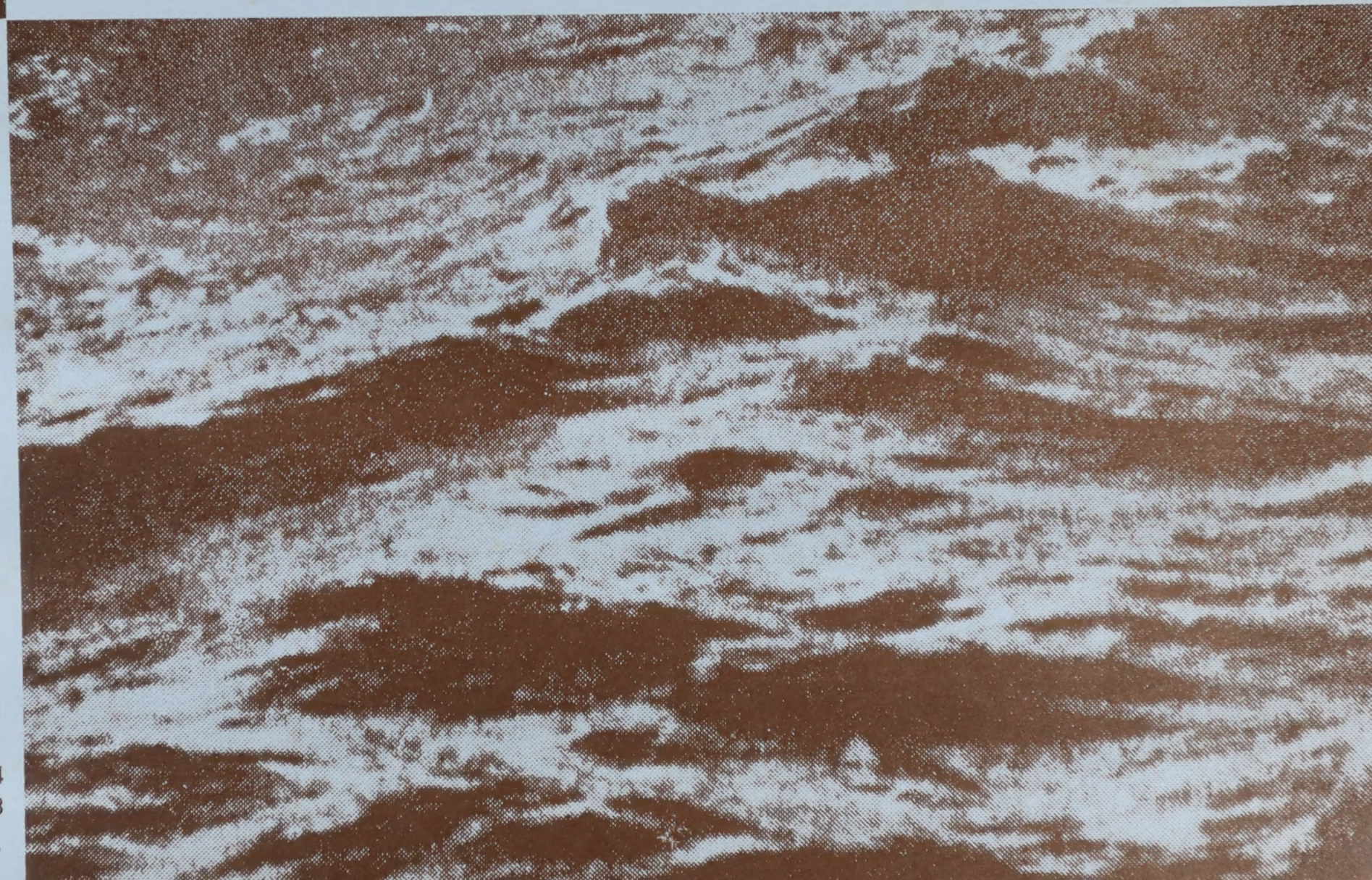
COMMERCE PUBLICATION

Commercial Fisheries Abstracts

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service



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UNITED STATES DEPARTMENT OF COMMERCE
Maurice H. Stans, *Secretary*

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
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FOREWORD

The Department of Commerce's National Marine Fisheries Service publishes the monthly journal *Commercial Fisheries Abstracts* as one means of communicating to the fishing industry and allied groups the status of current fishery research. The research includes the biological aspects of fishery science as well as technological studies dealing with aquatic resource supply, harvesting, processing, utilization, and distribution.

Commercial Fisheries Abstracts contains summaries of selected articles from trade, engineering, and scientific journals dealing with the entire spectrum of fishery science. The publication is designed to serve the needs of fishery scientists, engineers, and managers in industry, academic institutions, and government by supplying timely information on current progress in fishery research and technology.

0.3 NATURE OF FREE RADICALS IN FREEZE-DRIED FISHERY PRODUCTS AND OTHER LIPID-PROTEIN SYSTEMS

Roubal, William T. (National Marine Fisheries Service, Pioneer Research Laboratory, Seattle, Wash. 98102)
Fishery Bulletin 69, No. 2, 371-377 (April 1971)

The electron paramagnetic resonance spectrometer makes it possible to detect and study radicals which are produced during lipid peroxidation in freeze-dried lipid-protein systems. In such systems, two general types of resonances are observed. By studying effects of added antioxidants, added autoxidizable lipid, and type of substrate, it is possible to differentiate and characterize the two signals which are observed. It is postulated that the immobilized radicals observed in dry systems are the same as those that are responsible for damage at the molecular level in oxygenated lipid-protein-water emulsions, stored meats of normal moisture content, and in antioxidant deficiency states in man and animals.
[3 figures, 12 references] Author's abstract

0.31 (0.35) UNIQUE LIPIDS OF THE PORPOISE (TURSIOPS GILLI): DIFFERENCES IN TRIACYL GLYCEROLS AND WAX ESTERS OF ACOUSTIC (MANDIBULAR CANAL AND MELON) AND BLUBBER TISSUES

Varanasi, Usha, and Donald C. Malins (U.S. Department of Commerce, NOAA, National Marine Fisheries Service, Pioneer Research Laboratory, 2725 Montlake Blvd. East, Seattle, Wash. 98102)
Biochimica et Biophysica Acta 231, No. 2, 415-418 (March 16, 1971)

In earlier publications, the authors reported that the mandibular canal tissues of porpoises comprise unusual triacyl glycerols and wax esters containing large amounts of isovaleric acid and saturated long-chain iso acids [Biochemistry 9, 3629 (1970); ibid., p. 4576]. The fatty tissues of the mandibular canal and melon are involved in the echo location system of these mammals. Because of the unique composition of triacyl glycerols and wax esters of the mandibular canal, the authors reasoned that the high proportions of iso structures may be intimately associated with sound transmission. As a first step in a study of the possible role of unique lipids in bio-acoustics, they determined the acyl and the alcohol moieties of triacyl glycerols and wax esters from acoustic (mandibular canal and melon) tissues and nonacoustic (blubber) tissue of the porpoise. Using data collected in these and in previous experiments, the authors compared the differences in structure between the lipids of the acoustic and the blubber tissues. The acids were analyzed by gas-liquid chromatography as esters after transesterification with butanol-H_2SO_4; the alcohols from the wax esters were analyzed by gas-liquid chromatography as acetate derivatives.

The data are summarized in the table that follows.

(over)

0.35 (0.2)(4.2) INSIDE-OUTSIDE TRANSITIONS OF PHOSPHOLIPIDS IN VESICLE MEMBRANES

Kornberg, Roger D., and Harden M. McConnell (address correspondence to H. M. McConnell: Stauffer Laboratories for Physical Chemistry, Stanford University, Stanford, Calif. 94305)
Biochemistry 10, No. 7, 1111-1120 (March 30, 1971)

This article describes a direct method for measuring the flip-flop rate of any phospholipid whose polar part includes the paramagnetic nitroxide group. Specifically, it reports the rate of exchange of spin-labeled phosphatidylcholine (paramagnetic analog of phosphatidylcholine) between two monolayers which constitute the bilayer membrane of a phosphatidylcholine vesicle. The vesicle that results from prolonged sonication of egg phosphatidylcholine and spin-labeled phosphatidylcholine in salt solution has an aqueous compartment and a bilayer membrane. Sodium ascorbate at 0° C. produces an asymmetry in the distribution of paramagnetic molecules between the two monolayers of a vesicle membrane by abolishing the paramagnetism of spin-labeled molecules in the external monolayer of the membrane without affecting the paramagnetism of the internal molecules. At 30° C., the asymmetry in the distribution of paramagnetic molecules between the two monolayers of the vesicle membrane decays with a half-time of 6.5 hr. The probability of a spin-labeled phosphatidylcholine molecule passing from the internal monolayer of the vesicle membrane to the external monolayer is 0.07/hr. at 30° C.; the probability of a spin-labeled phosphatidylcholine molecule passing from the external monolayer to the internal monolayer is 0.04/hr. at 30° C.
[8 figures, 1 table, 29 references] FTP

0.36 (0.35) FLUORESCENT MODIFICATION OF SERUM ALBUMIN BY LIPID PEROXIDATION

Fletcher, B. L., and A. L. Tappel (Department of Food Science and Technology, University of California, Davis, Calif. 95616)
Lipids 6, No. 3, 172-175 (March 1971)

K. S. Chio and A. L. Tappel found earlier [Biochemistry 8, 2827 (1969)] that carbonyls derived from peroxidizing lipids react with protein to produce fluorescent chromophores. In this present study, the authors found that peroxidation of fatty acids bound to human serum albumin produces fluorescent chromophores in the protein when it is stored in the liquid, the powdered, or the crystalline form. Furthermore, in the use of model peroxidizing lipid-protein systems, they found that peroxidizing polyunsaturated fatty acid esters and carbonyls derived from peroxidizing lipids react with amino groups of protein to give products that have fluorescence spectra very similar to those for stored commercial preparations of serum albumin.
[4 figures, 1 table, 10 references] FTP

0.31 (0.35)

Component Tissue	Isovaleric acid	Saturated long-chain iso acids	Saturated iso alcohols	Isopentanol
	mole %	mole %	mole %	mole %
Triacyl glycerols				
Mandibular canal	43.0	20.4	--	--
Melon	50.5	21.5	--	--
Blubber	8.7	3.2	--	--
Wax esters				
Mandibular canal	43.6	17.5	47.5	2-3
Melon	58.4	21.0	61.4	2-3
Blubber	18.9	10.5	18.8	None

The triacyl glycerols and wax esters from the blubber contained relatively high amounts of straight-chain unsaturated acids and alcohols. The authors speculated that the preferential deposition by acoustic tissues for certain structural components such as isovaleric acid and saturated long-chain iso acids and alcohols may be intimately associated with the role of the mandibular canal and melon in porpoise biosonar.
[2 tables, 5 references] FTP

0.32 RELATIONSHIPS BETWEEN BINDING QUALITY OF MEAT AND MYOFIBRILLAR PROTEINS. PART II. THE CONTRIBUTION OF NATIVE TROPOMYOSIN AND ACTIN TO THE BINDING QUALITY OF MEAT

Nakayama, Teruo, and Yasushi Sato (Laboratory of Food Science and Technology (Animal Products), Faculty of Agriculture, Nagoya University, Nagoya, Japan)
Agricultural and Biological Chemistry 35, No. 2, 208-218 (February 1971)

The binding quality of meat is important in the production of comminuted products such as Kamaboko (boiled fish paste) and sausage. This study involved the examination of the effect of native tropomyosin and actin on the binding quality of meat (chicken hen). A concentrated solution of myosin A was prepared from the minced hen muscle [Y. Tonomura, S. Tokura, K. Sekiya, and K. Imamura, Archives of Biochemistry and Biophysics 95, 229 (1961)]. The contribution of tropomyosin and actin to binding quality was evaluated by measuring the change in viscosity of concentrated solutions of these materials. The concentrated solutions were incubated at 30° C.

The viscosity of the concentrated solution of myosin A increased, but that of the concentrated solution of F-actin did not. The viscosity of the concentrated solution of myosin B increased slightly, but that of the concentrated solution of native tropomyosin decreased markedly. The concentrated solution of myosin B containing 3 mM pyrophosphate and $MgCl_2$ showed a higher rate of increase in viscosity than did the concentrated solution of native tropomyosin-free myosin B.
[12 figures, 2 tables, 15 references] FTP

0.38 THE CONTROL OF PHOTOSYNTHETIC CARBON METABOLISM

Bassham, James A. (Laboratory of Chemical Biodynamics, Lawrence Radiation Laboratory, University of California, Berkeley, Calif. 94720)
Science 172, No. 3983, 526-534 (May 7, 1971)

The discussion deals with the regulation of the Calvin cycle (the reductive pentose phosphate cycle) in photosynthesis and movement of intermediate compounds out of the chloroplast (site of photosynthesis). Photosynthesis of compounds of carbon is regulated to allocate intermediates according to metabolic need. Along biosynthetic paths, pyruvate kinase (which controls the conversion of phosphoenolpyruvic acid to pyruvate) and sucrose phosphate synthetase (which controls sucrose synthesis) play important roles. The author states that these points of control have been activated artificially in Chlorella pyrenoidosa by the addition of ammonium ion resulting in increased protein synthesis. He suggests that perhaps in the future application of chemical spray to mature leaves which are producing mostly sucrose may switch their metabolism for a time back to protein production. [6 figures, 81 references] FTP

0.35 BIOCHEMICAL STUDIES ON FATTY LIVER. PART V. ON THE MECHANISM OF INDUCTION OF FATTY LIVER BY AMINO ACID IMBALANCE

Ogura, Masaji, Hideyuki Tanaka, and Hisayoshi Honda (Department of Agricultural Chemistry, Faculty of Agriculture, Utsunomiya University, Utsunomiya, Japan)
Agricultural and Biological Chemistry 35, No. 3, 370-376 (March 1971)

Earlier, M. Ogura, H. Tanaka, and A. Ito [Agricultural and Biological Chemistry 32, 920 (1968)] demonstrated that a major increase in triglycerides occurred in the lipid of the fatty liver (of rats) induced by an amino acid-imbalanced diet (8% casein + 0.3% DL-methionine, "threonine imbalance"). These results suggested that such fatty acid synthesis in the fatty liver may be different from the normal type. In the present study, the authors determined the changes in the lipid fractions of the liver of rats fed on an imbalanced diet, and examined the transport of lipid in the tissues of the rat.

Fatty livers were induced in rats by feeding them an amino acid-imbalanced diet (threonine imbalance). There was a remarkable increase in triglycerides in the lipid of the fatty livers. The transport of triglyceride from the liver to the plasma was not inhibited in the rats fed the imbalanced diet; furthermore, the transport of triglyceride from the adipose tissue to the liver was almost not altered. The authors state that the induction of fatty liver in rats by feeding them a threonine imbalanced diet is based mainly on the stimulation of triglyceride synthesis in the liver.
[3 figures, 8 tables, 22 references] FTP

0.38 STUDIES ON FIN WHALE PANCREATIC PROTEASES.
(8.59)(1.953) III. PROPERTIES OF PURIFIED FIN WHALE ANIONIC CHYMOTRYPSIN
Koide, Atsushi, and Yoshitaka Matsuoka (Eisai Res. Lab., Eisai Co., Ltd., Tokyo, Japan)
Chemical Abstracts 73, No. 21, 105746h (November 23, 1970)

0.4 (9.13) POSSIBLE HEPATIC FUNCTION FOR CRUSTACEAN BLOOD CELLS

Johnston, Michael A., and P. Spencer Davies (Department of Zoology, University of Glasgow, Glasgow W2, Scotland), and Hugh Y. Elder (Institute of Physiology, University of Glasgow)
Nature 230, No. 5294, 471-472 (April 16, 1971)

Crustacean blood apparently functions as a transport medium for low molecular weight metabolites. Conversely then, the hepatopancreas may be regarded as a liver analogue--the principal site for the storage and metabolism of fats and carbohydrates [H. J. Vonk, Physiology of the Crustacea 1, Ch. 8, edited by T. H. Waterman, Academic Press, New York (1960)].

The authors present evidence that, in the decapod crabs Libinia emarginata and Carcinus maenas, cells of the hemolymph maintain large quantities of polysaccharide, and that a large part of this polysaccharide is in the form of glycogen. They are investigating further the possibility that these cells act like a liver tissue, liberating free hexose sugars to circulation.

[2 figures, 1 table, 5 references] FTP

0.5 INACTIVATION OF BACTERIOPHAGES BY ASCORBIC ACID

Murata, Akira, Kazuko Kitagawa, and Rinjiro Saruno (Laboratory of Applied Microbiology, Department of Agricultural Chemistry, Saga University, Saga 840, Japan)
Agricultural and Biological Chemistry 35, No. 2, 294-296 (February 1971)

The authors found that L-ascorbic acid (vitamin C) was virucidal toward phage J 1 of Lactobacillus casei but did not inhibit the growth of the host bacteria. Ascorbic acid also showed virucidal activity toward certain other viruses of Escherichia coli and Bacillus subtilis. This observation suggests the possibility that ascorbic acid might be used in the dairy industry for prevention of bacteriophage infection.

[3 figures, 5 references] FTP

0.5 EFFECT OF HYDROXYUREA ON THE DEVELOPMENT OF BACTERIOPHAGE φX174

Morishima, Isao, Tohru Komano, and Konoshin Onodera (Laboratory of Biochemistry, Department of Agricultural Chemistry, Kyoto University, Kyoto, Japan)
Agricultural and Biological Chemistry 35, No. 2, 143-149 (February 1971)

Earlier workers demonstrated that hydroxyurea is a specific inhibitor of DNA (deoxyribonucleic acid) in some biological systems and that it has little or no effect on RNA (ribonucleic acid) and protein synthesis. When hydroxyurea is removed from the biological system, DNA synthesis recovers. Also, hydroxyurea inhibits the formation of infectious virus in some mammalian and bacterial viruses. The purpose of the present study was to obtain information that would elucidate the mechanism of the action of hydroxyurea on such synthesis of a bacteriophage. Specifically, the authors determined the effects of hydroxyurea on the macromolecular metabolism of Escherichia coli infected with bacteriophage φX174 and on the development of φX174.

At an appropriate concentration, hydroxyurea inhibited the synthesis of DNA in E. coli HF4701(HCR$^-$) and C(HCR$^+$) without preventing the synthesis of protein and RNA. Also, hydroxyurea inhibited the formation of mature infectious particles of bacteriophage φX174 in E. coli HF4701 without preventing the synthesis of viral protein. When hydroxyurea was removed from the biological system, phage formation and DNA synthesis recovered.

[7 figures, 13 references] FTP

0.6 (8.8) EFFECT OF ULTIMATE pH UPON THE WATER-HOLDING CAPACITY AND TENDERNESS OF MUTTON

Bouton, P. E., P. V. Harris, and W. R. Shorthose (CSIRO Division of Food Preservation, Meat Research Laboratory, P.O. Box 12, Cannon Hill, Brisbane, Queensland, Australia 4170)
Journal of Food Science 36, No. 3, 435-439 (April 1971)

Certain organoleptic properties (juiciness and tenderness) have been correlated with the water-holding capacity (WHC) of raw and cooked meat [R. Hamm, "Biochemistry of Meat Hydration," Adv. Food Res. 10, 355 (1960)]. In the present study, an attempt was made to determine the relationship between pH and the WHC, the moisture loss, and the tenderness of the raw muscle of sheep (mutton). Epinephrine was administered to sheep before slaughter to produce muscles with a range of pH from 5.6 to 7.0. The WHC of the raw meat was determined by a high-speed centrifugal method. Tenderness of the meat was determined by the Warner-Bratzler shear method and by the Instron Universal Testing Machine method.

The WHC values correlated highly with pH values. Cooking (65° C.) losses decreased linearly with increasing pH values; cooking losses (90° C.) showed little change up to a raw meat pH of about 5.9, then decreased linearly with increasing pH values. The amount of juice centrifugally extracted from the cooked meat increased linearly with pH values. The objective values for tenderness correlated highly with subjective evaluations.

[7 figures, 29 references] FTP

0.5 (3.15) MODE OF RADIATION RESISTANCE OF CLOSTRIDIUM BOTULINUM SPORES

Church, Brooks D., Gregory R. Germaine, and Durwood B. Rowley (North Star Research and Development Inst., Minneapolis, Minn.)
Final Rept. Apr 68-Mar 70, USA-NLABS-TR-71-4-FL, FL-112, 65 pp. (August 1970) Available from the National Technical Information Services, Operations Division, Springfield, Va. 22151. Order No. AD-717 563, PC$3.00, microfiche 95¢.
Government Reports Announcements 71, No. 6, 46 (March 25, 1971)

Work was conducted to delineate the mechanisms responsible for the extraordinary resistance of Clostridium botulinum spores to ionizing radiation as compared with vegetative cells. The findings indicate that the progression from the high resistance of spores to the sensitivity of vegetative cells proceeds in at least three discrete steps. Several biochemical events have been shown not to play a key role in the resistance and the state of hydration and configuration of DNA has emerged as a prime candidate to explain the changes in resistance. (Author)
Reprinted

0.7 (0.5)(9.2) NATIONAL ACADEMY OF SCIENCES ISSUES TWO MAJOR REFERENCE REPORTS

Anonymous
Food Product Development 5, No. 3, 8 (May 1971)

The first report "Evaluating the Safety of Food Chemicals" (55 pages, price $2.50) was issued by the Food Protection Subcommittee on Toxicology of the National Academy of Sciences. It deals with the approach and methods currently employed in safety evaluation, and predicting and interpreting the safety of foods. The second publication "Reference Methods for Microbiological Examination of Foods" (39 pages, price $2.25) was prepared by the Subcommittee on Food Microbiology of the Food Protection Committee. It deals with the preparation of the food sample, the aerobic plate count for mesophiles, methodology for coliform organisms, detection methods for salmonellae in foods, the coagulase positive staphylococci, and isolation of Clostridium botulinum and detection of toxins. The reports may be obtained from the Printing and Publishing Offices, National Academy of Sciences, 2101 Constitution Ave., N.W., Washington, D.C. 20418.
FTP

0.4 (9.19) DDT TISSUE RETENTION: SUDDEN RISE INDUCED BY THE ADDITION OF ALDRIN TO A FIXED DDT INTAKE

Deichmann, William B., William E. MacDonald, and Dewey A. Cubit (Department of Pharmacology and Research and Teaching Center of Toxicology, University of Miami School of Medicine, Coral Gables, Fla. 33124)
Science 172, No. 3980, 275-276 (April 16, 1971)

A suggestion was made that a physiological equilibrium has been reached with the present level of exposure to DDT and that continued exposure at this level will result in no additional tissue accumulation in humans ["Report of the Secretary's Commission on Pesticides and Their Relationship to Environmental Health," U.S. Department of Health, Education, and Welfare, Washington, D.C. (1969)]. The authors found in tests with purebred beagles that oral administration of aldrin to the male and female animals, whose diet already contained a fixed, regular, oral dosage of DDT resulted in a sudden, unexpected rise in the concentration of DDT, DDE, and DDD in blood and fat.
[1 table, 5 references]
FTP

0.6 (0.8)(3.337) ESTIMATING FOOD TEMPERATURES DURING VARIOUS PROCESSING OR HANDLING TREATMENTS

Hayakawa, Kan-Ichi (Food Science Department, Rutgers The State University, New Brunswick, N.J. 08903)
Journal of Food Science 36, No. 3, 378-385 (April 1971)

A procedure is described for predicting the transient temperature of a solid food exposed to time-variable ambient temperatures. Sample calculations are included for a fresh orange, a fresh carrot, and a canned food product.
[5 figures, 3 tables, Appendix, 20 references]
FTP

0.4 (6.72)(1.953) ANTAGONIZING SUBSTANCES OBTAINED FROM WHALE HEART EXTRACT TO VASOPRESSIN-INDUCED MYOCARDIAL HYPOXIA

Hiramatsu, Yoshio, Akihiro Izumi, Tadashi Tezuka, Yuichiro Kuroswa (Pharmacol. Chem. Res. Dep., Teikoku Hormone Mfg. Co. Ltd., Kawasaki, Japan)
Chemical Abstracts 74, No. 9, 40236r (March 1, 1971)

0.4 NEW TYPE OF THYROCALCITONIN

Stekol'nikov, L. I. (Moscow, U.S.S.R.)
Chemical Abstracts 74, No. 11, 50226b (March 15, 1971)

0.6 (6.18) TREATMENT OF WASTE MATERIALS ESPECIALLY SEWAGE SLUDGE, BY ADMIXING WITH PLASTER OF PARIS, FOR USE AS FERTILIZER

Coghill, Douglas (pat.)
South African Patent 6,808,402 (June 18, 1970)
Chemical Abstracts 74, No. 18, 90980z (May 3, 1971)

0.6 AROMA UND GESCHMACKSSTOFFE IN LEBENSMITTELN (AROMA AND FLAVOR COMPOUNDS IN FOODS)

Solms, J., and H. Neukom (editors)
Forster-Verlag AG., Zurich, 288 pp. (1970) (Price not listed.)
Y. Pomeranz (reviewer)
Food Technology 25, No. 5, 89 (May 1971)

Thirteen lectures (11 in German and 2 in English) that were presented in a short course held in April 1967 (organized by the Agricultural Institute of E.T.H.) in Zurich. The book is not a basic and comprehensive text: it is an overview of information on the subject; it summarizes and updates the information in available textbooks; and it describes the specific areas that were investigated by the panel of 19 contributors.
FTP

0.8 (9.11) SIMULATION OF TIDAL MOTION IN COMPLEX RIVER SYSTEMS AND INLETS BY A METHOD OF OVERLAPPING SEGMENTS

Henry, R. F. (Marine Sciences Branch, Department of Energy, Mines and Resources, Ottawa, Canada)
Manuscript Report Series No. 17, iii + 30 pp. (1971)

A common technique in analog simulation of systems governed by hyperbolic partial differential equations is to separate the space variable(s) into discrete entities and thus obtain an equivalent system of coupled ordinary differential equations, one for each of the spatial grid points, with time as the independent continuous variable. However, if the domain governed by the equations is large, applications for such a technique are limited by the need for considerable amounts of analog equipment. For a second-order hyperbolic equation such as that governing tidal motion in inlets or rivers, each grid point requires two integrators; thus the size of the system that can be simulated on a typical general-purpose analog computer is quite limited. A possible solution to this difficulty lies in dividing the domain of interest into segments small enough to be simulated individually and then piecing together the solutions to the various segments into one whole solution. This type of operation requires a hybrid rather than an analog computer, since the required data-handling operations cannot be undertaken without the help of a digital computer.

With the method proposed here, tidal motions for a coastal inlet or river system characterized by many bifurcations, confluences, or islands can be computed. The inlet is divided into overlapping segments, and the tidal motions are

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1.01 (9.6) THE SEA AGAINST HUNGER

Idyll, C. P. (Division of Fishery Sciences of the Institute of Marine and Atmospheric Sciences, University of Miami, Fla.)
International Marine Publishing Company, 21 Elm Street, Camden, Maine 04843, 234 pp. (n.d.), $7.95
National Fisherman 52, No. 2, 12S (June 1971)

The book thoroughly investigates the premise that the vast untapped resources of the oceans can end man's hunger problem. It points out that, although the sea produces enormous quantities of food and can produce substantially even more, man himself has set up obstacles to harvesting food from the sea that neither science nor need may be able to overcome completely. The chapters are titled: Hunger; Present Contribution of the Sea; Food Production in the Sea; The Harvest of Plankton; The Harvest of Seaweed; Farming the Sea; Transplantations; The Great Fishing Nations; Fish Meal and Fish Protein Concentrate; The Worldwide Outlook for More Fish; Fishing, Now and in the Future; Freedom to Fish; and The Realities.
[85 photographs and drawings, bibliography] LB

0.8 (9.19) FOOD INDUSTRY WASTES: TECHNOLOGICAL ASPECTS OF DISPOSAL AND UTILIZATION

Litchfield, John H. (Batelle Memorial Institute, Columbus, Ohio)
Chemical Engineering Progress Symposium Series 67, No. 108, 164-172 (1971) (American Institute of Chemical Engineers, 345 East 47th Street, New York, N.Y. 10017)

Food industry wastes usually show high BOD (Biochemical Oxygen Demand) and high suspended solids. Various treatment methods can be applied to food industry wastes--the selection of the appropriate method depends upon plant location, plant size, and the range of products processed. The author suggests that increased attention should be given to improved control of production processes and utilization of water in food processing industries as a means of minimizing waste problems.
[3 tables, 50 references] FTP

1.0112 (1.125) ANALYSIS OF THE OPERATIONS OF SEVEN HAWAIIAN SKIPJACK TUNA FISHING VESSELS, JUNE-AUGUST 1967

Uchida, Richard N., and Ray F. Sumida (National Marine Fisheries Service, NOAA, Hawaii Area Fishery Research Center, Honolulu, Hawaii 96812)
Special Scientific Report--Fisheries No. 629, v + 25 pp. (March 1971) (U.S. Department of Commerce, NOAA, National Marine Fisheries Service, Seattle, Wash. 98115)

Analysis of operational data collected from seven Hawaiian skipjack tuna fishing vessels in the summer of 1967 showed that the vessels expended 38 percent of their day-baiting effort at Kaneohe Bay, which yielded 14.7 buckets of bait per set. Keehi Lagoon was, by far, the most productive night-baiting ground; it received 84 percent of the night effort and yielded 10.4 buckets per set.

On fishing trips which averaged 15.5 hours, 31 percent of the time was devoted to traveling to and from the fishing grounds, 62 percent was occupied by scouting, and only 7 percent was actually spent fishing. The vessels chummed 83 percent of the schools sighted, successfully fished 57 percent of the schools chummed, and used an average of 12.8 buckets of bait per trip. Most often seven men fished per school. Fishing duration among the vessels ranged from 1 to 155 minutes, but most schools were fished only for short periods.

Schools of large skipjack tuna (7 kg. or more), which dominate the summer catch, were usually fished further offshore.

About half of the schools sighted were in waters to the west of Oahu. Sightings increased from daybreak to a peak at 0801-0900, dipped at 1001-1100, then rose to a second peak at 1301-1400. The vessels caught 62 percent of their day's catch after 1200. Cloud cover and wave height at the time of fishing had no effect on the success or failure in fishing the school. Although the predominant

 (over)

1.01111 MARINE RESOURCES OF NEWFOUNDLAND
(9.6)

Templeman, Wilfred
International Marine Publishing Co., Camden, Maine, 178 pp. (n.d.),$3.50
National Fisherman 52, No. 2, 2S (June 1971)

This book covers the following fisheries: Atlantic cod, haddock, red fish, American plaice, witch flounder, Atlantic halibut, Greenland halibut (or turbot), Atlantic herring, Atlantic mackerel, bluefin tuna, swordfish, Atlantic salmon, Pacific salmon, trout, American eel, capelin, American smelt, pollock, white hake, wolffish, probeagle, spiny dogfish, skate, American lobster, shrimp, crab, squid, scallop, seal, whale, miscellaneous marine fishes and mollusks, and seaweeds. [70-plus photographs and diagrams; a comprehensive bibliography] LB

1.011 THE FUTURE OF THE FISHING INDUSTRY OF THE UNITED STATES
(9.6)

Gilbert, DeWitt (ed.)
International Marine Publishing Co., Camden, Maine, 340 pp. (1968), $10
National Fisherman 52, No. 2, 2S (June 1971)

This book is the complete report of a conference held at the University of Washington College of Fisheries in 1968. It contains 58 chapters divided into the following eight sections: Raw Material Supply, Cost Factors, Fishing Problems, Processing Needs, Markets, Social and Political Problems, Education and Training, and Legal Problems. [62 illustrations] LB

0.8 SALMONID-HATCHERY WASTE WATER TREATMENT
(9.19)

Liao, Paul B. (Water Air Resour. Div., Univ. Washington, Seattle, Wash.)
Chemical Abstracts 74, No. 18, 90950q (May 3, 1971)

0.8 (9.11)

computed separately for each segment over a time increment short enough to ensure that errors attributable to neglect of neighboring segments are confined to the regions of overlap. The tidal motion for the whole inlet or river system at the end of each increment is found by discarding erroneous portions of the various segmental solutions and piecing together the remaining portions. The method permits (1) hybrid simulation of large inlet systems even when the amount of analog equipment available is limited; (2) in purely digital computation of tidal motions, avoidance of the difficulties of programming a single large difference scheme to cover a whole inlet or river system; (3) reduction of the problem to a linking of standard subroutines representing commonly encountered features, such as bifurcations and confluences.

The author presents results of a simple numerical experiment designed (1) to test the validity of the proposed method in a known physical situation and (2) to compare various methods of linking adjacent segments.

[13 figures, 4 references] LB

1.30 THE EFFECT OF SUPERIMPOSED MORTALITIES ON REPRODUCTION CURVES
(9.17)

Junge, Charles O. (Fish Comm. of Oregon, Research Div., Clackamas, Oreg.)
Research Reports of the Fish Comm. of Oregon 2, No. 1, 56-63 (1970)
Sport Fishery Abstracts 16, No. 1, Abstract 13059, 65 (1971)

The relative effects of salmonid smolt kills, "racial" kills, and adult kills on a completely general reproduction curve are studied. It is shown that for non-selective mortalities, smolt kills have a greater effect on the optimum sustainable yield than racial kills and a much more severe effect than adult kills of the same magnitude. For illustration, the results are applied to a Ricker-type reproduction curve. (Auth.) Reprinted

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1.0112 (1.125)

species of bird associated with the school was not a good indicator of fishing success, size of the bird flock differed significantly among those schools with and without catches. Among schools yielding catches, the vessels found most associated with 50 or more birds; among those unsuccessfully fished, the vessels found most associated with 11-50 birds.

Data on support activities showed that it usually took nine men one-half hour to unload about 3.4 metric tons of skipjack tuna. The rate of unloading depended largely on the size of the fish. Loading ice required 6.6 minutes.

Comparison of data from high- and low-producing vessels showed that a high-producing vessel chummed the schools longer, used more bait in fishing, tended to remain with the school longer, and was successful in fishing a higher percentage of the schools it sighted.

[14 figures, 21 tables, 12 references] Authors' abstract

0.8 CORRECT CHIMNEY DESIGN
(9.19)(0.12)

Lees, B.
Pollution in the Seventies. Suppl. Maint. Engng industry, Process Heat., pp. 34-35 (November 1970)
BFMIRA Abstracts 24, No. 4, Abstract No. 1118, 242 (April 1971)

"Low temperature corrosion problems associated with the combustion of sulphur-bearing fuels can be solved by ensuring that surfaces in contact with flue gases are maintained above the acid dewpoint. This article is descriptive of how this principle has been applied to chimneys." Summary. Reprinted

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0.8 SLUDGE HANDLING AND DISPOSAL IN TROPICAL DEVELOPING COUNTRIES
(9.19)

Pescod, M. B. (Asian-Institut of Technology, Bangkok, Thailand)
Journal of Water Pollution Control Federation 43, No. 4, 555-570 (April 1971)

The author recommends anaerobic digestion, lagooning, and sand-bed drying as the most suitable sludge handling methods in the near future for use in tropical developing countries.

[12 figures, 8 tables, 5 references] FTP

1.12
(9.12)(1.013)
(9.11)

DISTRIBUCION DE LOS ATUNES EN EL PRIMER TRIMESTRE DEL AÑO EN RELACIÓN CON LAS CONDICIONES OCEANOGRÁFICAS GENERALES FRENTE A CHILE Y PERÚ
[DISTRIBUTION OF TUNA IN RELATION TO GENERAL OCEANOGRAPHIC CONDITIONS OFF CHILE AND PERU DURING THE FIRST THREE MONTHS OF THE YEAR]

Sandoval, Eliseo
Boletin Cientifico No. 14, 15-86 (1970) (Biblioteca, Instituto de Fomento Pesquero, Pedro de Valdivia 2633, Casilla 1287, Santiago, Chile)

The flow of the Pacific Ocean waters has been surveyed by various scientists, but the Southeastern Pacific area, especially off the coast of Chile, still remains only partially studied. This work gives a better insight into this area. Supplemented by additional data and observations gathered during the years 1962 to 1969, a clearer picture is provided that can be used in the future for the development of the different fisheries.

In this paper a study is made of the summer (January-February-March) distribution of temperature, salinity and oxygen, besides the geostrophic dynamics related to 500 decibars, from latitude 5°N and 50°S to a longitude stretching to 98°W along the coast of Chile, Peru and Ecuador. The distribution of the physical and chemical characteristics is closely related to the abundance of some marine species of tuna, such as yellowfin tuna (Thunnus albacares), albacore (Thunnus alalunga), bigeye tuna (Thunnus obesus), and striped marlin (Tetrapturus audax).

This paper was read at the 21st. Tuna Conference, held at the University of California, Lake Arrowhead, California, October 12-14, 1970.

[46 figures, 3 tables, 33 references] Reprinted in part

1.4

SYNOPSIS OF BIOLOGICAL DATA ON PACIFIC OCEAN PERCH, SEBASTODES ALUTUS

Major, Richard L., and Herbert H. Shippen (National Marine Fisheries Service, NOAA, Biological Laboratory, Seattle, Wash. 98102)
Circular 347, iii + 38 pp. (December 1970), FAO Fisheries Synopsis No. 79 (U.S. Department of Commerce, NOAA, National Marine Fisheries Service, Washington, D.C. 20235)

This synopsis has information on the taxonomy, life history, population structure, and harvesting of a species that is being intensively fished and studied by the United States, Canada, the U.S.S.R., and Japan. This synopsis includes data from scientific papers either printed in English or translated from Japanese and Russian into English.

[31 figures, 11 tables, 66 references] Authors' abstract

1.126
(1.013)
(1.0160)

BIOLOGY AND DISTRIBUTION OF THE YELLOWFIN TUNA IN THE TROPICAL PART OF ATLANTIC OCEAN (BIOLOGIYA I RASPREDELENIE ZHELTOPEROGO TUNTSA (NEOTHUNNUS ALBACORA LOWE). V. TROPICHESKOI CHASTI ATLANTICHESKOGO OKEANA)

Zharov, V. L., and Yu. A. Torin
Trans. of Atlanticheskii Nauchno-Issledovatelskii Institut Rybnogo Khozyaistva i Okeanografii. Trudy (USSR) 11, pp. 27-35 (1964) by M. Slessers
Rept. No. NOO-Trans 468, 14 pp. (1971) (Naval Oceanographic Office, Washington, D.C. Available from the National Technical Information Service, Operations Division, Springfield, Va. 22151. Order No. AD-720 097, PC $3.00, microfiche 95¢
Government Reports Announcements 71, No. 9, 81-82 (May 10, 1971)

The paper discusses the Soviet observations of tuna fishes which were carried out in the coastal belt of S. America, W. Africa and the tropical zone of the Atlantic Ocean during 1959-1962. Since the species consists of two distinct groups, larger and smaller tunas, the distribution, migration and concentrations of these groups are charted separately, pointing out the hydrological conditions that favor the concentrations of these fishes, i.e., the upwelling, convergence and divergence belts, variations of water temperature, salinity and phosphorus content. (Author) Reprinted

2.01

TRIMETHYLAMINE-PRODUCING BACTERIA ON HADDOCK (MELANOGRAMMUS AEGLEFINUS) FILLETS DURING REFRIGERATED STORAGE

Laycock, R. A., and L. W. Regier (Fisheries Research Board of Canada Halifax Laboratory, Halifax, Nova Scotia)
Journal of the Fisheries Research Board of Canada 28, No. 3, 305-309 (March 1971)

The authors determined the numbers and kinds of organisms capable of producing trimethylamine (TMA) that occurred on haddock fillets when the fish fillets were packaged in oxygen-permeable film and stored at 3° C. The purpose of the study was to obtain information leading to an understanding of the possible relation between TMA production and bacterial spoilage.

Achromobacters, Pseudomonas groups I, II, and III/IV, P. putrefaciens, flavobacteria, vibrios, Bacillus spp., coryneforms, and micrococci were isolated from the haddock fillets stored at 3° C. All these groups contained organisms that were capable of producing TMA from trimethylamine oxide. The percentage of isolates in the flora that were capable of producing TMA remained nearly constant during storage of the fillets (to spoilage), but the composition altered markedly. All isolates of Pseudomonas putrefaciens were TMA producers and the organism was the most numerous of the TMA producers during storage of the fillets. The authors concluded that P. putrefaciens was largely responsible for the production of TMA in the fillets. The achromobacters initially formed over half of the TMA-producing flora but decreased percentage-wise during storage of the fillets and were not considered as significant contributors to the production of TMA. The coryneform group was the only one to show an increase in the percentage of TMA producers during storage of the fillets.

[5 figures, 12 references] FTP

1.3 (9.3) TOTAL LENGTH-WEIGHT RELATIONSHIPS AND CONDITION FACTORS FOR THE ARCTIC GRAYLING, THYMALLUS ARCTICUS (PALLAS), IN ALASKA

Reed, Roger J., and James A. McCann (Massachusetts Cooperative Fishery Unit, University of Massachusetts, Amherst, Mass. 01002)
Transactions of the American Fisheries Society 100, No. 2, 358-359 (April 1971)

Length-weight relationships and condition factors are data used by fishery investigators in research and management. These determinations are not available for the Arctic grayling, Thymallus arcticus (Pallas), in Alaska. Therefore, the original work sheets used by Reed (1964) have been re-examined and this deficiency corrected. [1 table, 3 references] Authors' introduction

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2.1112 A LIFT NET FOR CATCHING BAIT FISH ATTRACTED TO LIGHT

Floyd, Hilton M. (Exploratory Fishing and Gear Research Station, South Atlantic Fisheries Explorations, National Marine Fisheries Service, NOAA, Brunswick, Ga. 31520)
Fishery Leaflet 638, 3 pp. (April 1971) (U.S. Department of Commerce, NOAA, National Marine Fisheries Service, Seattle, Wash. 98115)

This paper describes the construction and operation of an effective means for collecting small bait fish such as anchovies, sardines, chub mackerel, thread herring, and cigarfish.

The gear is small and portable and can be easily handled by one man from a boat, dock, or bridge. Because the net is light, its use is limited to areas of little or no current.

All materials needed to construct the described gear are readily available at hardware stores, lumber yards, or commercial fishermen's suppliers.
[6 figures, 2 references] Reprinted in part

1.23 OCCURRENCE AND ABUNDANCE OF LARVAL ATLANTIC MENHADEN, BREVOORTIA TYRANNUS, AT TWO NORTH CAROLINA INLETS WITH NOTES ON ASSOCIATED SPECIES

Lewis, Robert M., and Walter C. Mann (National Marine Fisheries Service, NOAA, Center for Estuarine and Menhaden Research, Beaufort, N.C. 28516)
Transactions of the American Fisheries Society 100, No. 2, 296-301 (April 1971)

The purpose of this study was to determine relative indexes of abundance of Atlantic menhaden larvae that moved through two adjacent North Carolina inlets and what factors influence abundance. We hope to assess the usefulness of larval abundance indexes as measures of spawning success and year-class strength. In the future we plan to determine which of the estuarine nursery areas supports the most young menhaden and what factors affect their well-being.

A comparison was made of relative indexes of abundance for Atlantic menhaden larvae entering two North Carolina inlets. Larvae entered the inlets from November through April 1966-67 and 1967-68, and were most abundant in March during both survey periods. Collections over 24 hours showed that larvae are more abundant at night than in the day and are more abundant in the slower tidal currents. As the larvae drift back and forth on the ebbing and flooding currents and feed on the plankton, their condition factors (weight/length^3) increase. The abundance of 23 other species of fish collected with the menhaden is also discussed.
[5 figures, 1 table, 6 references] Reprinted in part

1.84 (1.0117) CALICO SCALLOP DISTRIBUTION, ABUNDANCE, AND YIELD OFF EASTERN FLORIDA, 1967-68

Roe, Richard B. (National Marine Fisheries Service, Exploratory Fishing and Gear Research Station, Pascagoula, Miss. 39567), Robert Cummins, Jr. (NMFS, Exploratory Fishing and Gear Research Station, Brunswick, Ga. 31520), and Harvey R. Bullis, Jr. (NMFS, Washington, D.C. 20240)
Fishery Bulletin 69, No. 2, 399-409 (April 1971)

During 18 months, from August 1967 to December 1968, the National Marine Fisheries Service Exploratory Fishing and Gear Research Base in Pascagoula, Miss., conducted a comprehensive survey of the calico scallop (Argopecten gibbus) grounds off eastern Florida. The survey disclosed various aspects of the life history, distribution, abundance, and yield and annual variation in geographical and depth distribution. Calico scallops have a short life span of from 18 to 24 months. Predictions for a fall fishery are possible since distribution and abundance are established at spat set and can be delineated by midsummer. A fall fishery is recommended as catch rates and yield were highest between September and December and decreased rapidly during late winter and spring.
[10 figures, 3 tables, 16 references] Authors' abstract

2.113 FUNGUSPROOFING. (INDUSTRIAL PROCESSING SERIES). VOLUME I.

Report bibliography Dec 43-Jul 70.
Rept. No. DDC-TAS-70-83-1, 74 pp. (February 1971) (Defense Documentation Center, Alexandria, Va.) Available from the National Technical Information Service, Operations Division, Springfield, Va. 22151. Order No. AD-720 202, PC $3.00, microfiche 95¢
Government Reports Announcements 71, No. 9, 51 (May 10, 1971)

The bibiolgraph is the first volume of a two-volume set on Fungusproofing in a series of bibliographies on Industrial Processing. It includes 44 annotated references and covers the period from January 1953 to January 1971. Corporate author-monitoring agency, subject, title, personal author, and report number indexes are included. Reprinted

2.12 (9.11) MOVEMENT GUIDE TO U.S. RESEARCH FLEET

Anonymous
Fishing News International 10, No. 4, 56 (April 1971)

From March through September 1971, 116 U.S. owned or sponsored ships will participate in the national marine science program. Most of these ships can accommodate visiting scientists and any instrumentation they may require. At intervals, the Marine Sciences Affairs Staff of the Office of the Oceanographer of the Navy issues a report, "Oceanographic Ship Operating Schedules," giving each ship's characteristics, the geographic area of its operations, the type of work to be performed, the number of visiting scientists it can accommodate, the name of the chief scientist on board, and the expected cruise periods. The National Council on Marine Resources and Engineering Development is using the reports to analyze current and future use of vessels in the oceanographic fleet.

Single copies of the report are available from Marine Sciences Affairs Staff Office of the Oceanographer of the Navy, Building 159E, Room 476, Washington Navy Yard, Washington, D.C. 20390. There is no charge. Scientists should request berth space from the agency or institution operating the ship. LB

2.146 (9.6) ECHO FISHING

Haines, R. G.
International Marine Publishing Co., Camden, Maine, 130 pp. (1969), $9.50
National Fisherman 52, No. 2, 1S (June 1971)

The basic principles of underwater sound propagation and the methods of applying them in systems for catching fish are explained in nontechnical terms. Of particular value in the description of chart interpretation and application of the gear to fishing are 28 photographs of echo traces with full explanations of the kind and number of fish indicated on each trace.
[73 photographs and diagrams] LB

2.15 STUDIES ON THE USE OF CARBON DIOXIDE DISSOLVED IN REFRIGERATED BRINE FOR THE PRESERVATION OF WHOLE FISH

Barnett, Harold J., Richard W. Nelson, Patrick J. Hunter, Steven Bauer, and Herman Groninger (National Marine Fisheries Service Technological Laboratory, Seattle, Wash. 98102)
Fishery Bulletin 69, No. 2, 433-442 (April 1971)

Carbon dioxide, refrigerated brine, and appropriate combination use of both have been used to help preserve meat, poultry, and fishery products. The specific purpose of the present study was to determine the preservative effect of holding the rockfish Sebastodes flavidus and chum salmon Oncorhynchus keta in refrigerated (31° F.) brine treated with CO_2 (carbon dioxide).

The rockfish stored in refrigerated brine treated with CO_2 had a storage life of about 1 week longer than that of the rockfish stored in plain (untreated) refrigerated brine. Furthermore, the carbon dioxide treated brine inhibited growth of bacteria on, and decreased the rate of quality loss of, the rockfish. Similar results were obtained with the chum salmon.

Refrigerated brine treated with CO_2 is more effective in preserving certain fish than is plain (untreated) refrigerated brine. But, certain information on the use of refrigerated brine treated with CO_2 must be obtained before the medium can be recommended for rockfish and salmon. This information includes absorption of water and uptake of salt by the fish, loss of soluble protein from the fish, and the shelf life of the product produced from the refrigerated fish. Corrosion of equipment may also be a problem. The authors state that future studies will be directed towards obtaining such information.
[2 figures, 4 tables, 21 references] FTP

2.146 UNDERWATER OBSERVATION USING SONAR
(9.6)

Tucker, D. G.
International Marine Publishing Co., Camden, Maine, 144 pp. (n.d.), $7.50
National Fisherman 52, No. 2, 2S (June 1971)

The author reviews the whole problem of underwater observation; describes many of the methods currently used in underwater observation; explains what sound waves are, how they form beams in the sea, and how objects in the beams produce the echoes that form the basis of sonar observation; and tells how sonar systems operate, what characteristics limit their performance, and how their expected performance can be calculated.
[51 diagrams and photographs] LB

2.3 CRAB MEAT PROCESSING

Tolley, C. B. (pat.)
U.S. Patent 3,555,595
Food Technology 25, No. 5, 56 (May 1971)

The apparatus removes meat from crab bodies by centrifugal means. FTP

2.116 MODERN MARINE ELECTRICITY AND ELECTRONICS
(2.113)(2.114)

Smith, Percy de Willard
International Marine Publishing Co., Camden, Maine, 704 pp. (n.d.), $12.75
National Fisherman 52, No. 2, 4S (June 1971)

The main sections of this extensively revised edition of a standard marine reference book are:

Introduction	Motor Starting and Control Equipment
A-C and D-C Light and Power Systems	The Group Control
Voltage Regulation	Deck Machinery
Generators	Electrical Propulsion
Motors	Interior Communication
The Sperry Gyro-Pilot	The Gyrocompass
Maintenance	Hull Corrosion and Cathodic Protection

Tables and Other Useful Information.

A detachable envelope accompanying the book contains 20 large schematic and wiring diagrams of switchboards, cubicles, propulsion-control systems, and other electrical systems. The book is thoroughly indexed.
[over 450 illustrations] LB

2.1471 PAIR TRAWLING

Corrigall, A. (Marine Laboratory, Aberdeen, Scotland)
World Fishing 20, No. 4, 26 (April 1971)

In the northeast Atlantic, pair trawling is confined to catching of herring or sprats in midwater, but some fishermen have attempted bottom fishing by the method. The Japanese have practiced pair trawling for some time and have even suggested that a pair of 1,000 hp. vessels are cheaper to build and more profitable to operate than one 2,000 hp. stern trawler. Some Canadian fishermen, with comparatively low power vessels, have teamed up, profitably, for pair seining. The author suggests that in Scotland pair fishing (for fish) could be a useful alternative venture for low-powered vessels engaged seasonally for shellfish. This article describes briefly the principles of correct operation of pair trawls.

The headline of the trawl should be directly above the footrope (so that the net is fishing at the proper angle of incidence). The four bridles should approach the net at the same angle (this ensures that the net is fully open). Experimental studies showed that the headline and sidelines have an opening height and width of 50 to 55% of their lengths. The lead-in angles of the bridles should lie between 13 and 16 degrees (assuming the bridles are in the shape of a catenary).

The relative towing speed should be high so that the fish do not avoid the net. The distance between towing vessels is critical (excessive distance reduces towing speed). The distance between towing vessels (as recommended by Russian fishermen and as appropriate to their gear) for warp lengths of 50, 100, 200, 400, and 600 fathoms are, respectively, 47, 70, 118, 202, and 300 fathoms.
[1 figure] FTP

2.3 (1.86) PROCESS OF EXTRACTING MEAT FROM CRABTAILS

Bynagte, Peter W. (San Diego, Calif.) (assignor to Westgate-California Foods, Inc., San Diego, Calif.)
U.S. Patent 3,577,243 (May 4, 1971)

Crab tails and the meat they contain are normally discarded as waste, since processors find that removing the meat is so difficult it is uneconomical. Yet crab tails contain 2 or 3 oz. of usable meat that could be recovered as a unit if some economical process for doing so were available. The process described in this patent is designed for that purpose. The crab tails are dipped into a solution of salt water, sodium acid pyrophosphate or calcium acid pyrophosphate, and sodium tripolyphosphate for at least 2 min. and the solution is agitated. The crab tails may be left in the solution as long as it takes to release the crab meat from the shell and the heavy skin. Soaks of as long as 24 hr., the author says, will not damage the recovered crab meat. The crab tails are then precooked in boiling water for about 12 min.; this precooking removes the solution from the meat. LB

2.6 (9.6)(2.119) MARINE INSURANCE CLAIMS

Buglass, Leslie J.
International Marine Publishing Co., Camden, Maine, 169 pp. (n.d.), $4
National Fisherman 52, No. 2, 4S (June 1971)

This book deals with the fundamentals of marine insurance, particularly with claims; its direction is toward the layman as well as the professional. Chapter headings are as follows:

Introduction to Marine Insurance	Total Losses
Risks Covered by a Policy of Marine Insurance	Particular Average
Salvage Expenses and Sue and Labor Charges	General Average
Subrogation and Double Insurance	Liabilities to Third Parties
Marine Insurance Claims on the Great Lakes	Bibliography of Marine Insurance

Appendices cover the following: American hull form of policy, rules of practice of the Association of Average Adjusters of the United States, resolutions and rules of practice of the Great Lakes Protective Association, Marine Insurance Act, York/Antwerp Rules (1950), and Merritt-Chapman and Scott Corporation's form of salvage agreement. LB

2.9 CHARACTERIZATION AND CHEMICAL MODIFICATIONS OF TOXINS ISOLATED FROM THE VENOMS OF THE SEA SNAKE, LATICAUDA SEMIFASCIATA, FROM PHILIPPINES

Tu, Anthony T., Bor-shyue Hong, and Thomas N. Solie (Department of Biochemistry, Colorado State University, Fort Collins, Colo. 80521)
Biochemistry 10, No. 8, 1295-1304 (April 13, 1971)

The venom of the sea snake contains two toxins. Both toxins were isolated in crystalline form. The molecular weight was approximately 6,800 for each. The amino-acid composition of both are quite similar.

Toxin "a" contains 62 amino-acid residues; toxin "b" contains 61. No free sulfhydryl groups were detected. Both toxins are a single polypeptide chain with arginine at the N terminal and aspartic acid at the C terminal. The isoelectric point of toxin "a" is 9.15 and of toxin "b" is 9.34. Heating the toxins to 100° C. for 30 min. or exposing them to pH extremes from 1 to 11 did not alter their toxicity. When the tryptophan residue in the purified toxins was modified with N-bromosuccinimide, the toxicity of the toxins was completely lost; however, these modified toxins showed no change in antigenicity. There was no change in the toxicity when the lysine and arginine residues of the purified toxins were modified. [9 figures, 8 tables, 48 references] FTP

3.15 (2.05) TOXIN PRODUCTION BY NATURALLY OCCURRING LEVELS OF CLOSTRIDIUM BOTULINUM IN IRRADIATED AND NONIRRADIATED SEAFOOD

Nickerson, J. T. R., and S. A. Goldblith (Massachusetts Inst. of Tech., Cambridge, Mass.)
Final Report, 1970 (Revision) Contract AT(30-1)-4049, 26 pp. (January 1971) Available from the National Technical Information Service, Operations Division, Springfield, Va. 22151. Order No. MIT-4049-2, price on request.
Nuclear Science Abstracts 25, No. 8, 1619 (April 30, 1971)

A total of 150 samples (450 individual portions) of commercially produced cod and haddock fillets have been incubated and tested for botulinum toxin. Each sample consisted of ground and mixed cod or haddock fillets, packaged in polyethylene as three different 100 gram portions. Among the three 100 gram portions which made up each sample, one received no further treatment, one was irradiated with gamma rays at a dose level of 100 Krad and one was irradiated with gamma rays at a dose level of 200 Krad. (As packaged the conditions in the fish portions were aerobic but doubtlessly changed to anaerobic as bacterial growth proceeded during incubation.) All portions of all samples were incubated for 6 days at 70° F, then extracted with cold gel-phosphate buffer. Portions of the trypsinized and non-trypsinized extracts were injected intraperitoneally into mice (protected and non-protected with botulinum antitoxin, types A, B and E) and the mice were observed over a period of 96 hours for symptoms of botulism and death. All mice had been treated with antibiotics prior to injection. Among the 450 individual portions tested, only one, a 200 Krad treated portion, caused symptoms and death typical of botulism upon injection into mice. Because of various circumstances (time of

(over)

2.8 THE PENETRATION OF SALT AND OF HEAT INTO FOODSTUFFS WHILE BEING COOKED

Carlheim-Gyllenskold, H. (Acta Polytechnica Scandinavica, Stockholm, Sweden) Report APS-CH-93, 91 pp. (1970) Available from the National Technical Information Service, Operations Division, Springfield, Va. 22151. Order No. PB-197 695, PC $3.00, microfiche 95¢.
Government Reports Announcements 71, No. 8, 56 (April 25, 1971)

A study was made, with sample bodies of meat and of hardened gelatine immersed in a salt solution, of how the salt content at various levels is dependent on time and the concentration of salt in the solution. Investigations were made by several methods of how salt penetrated into foodstuffs when cooked in water with different salt concentrations or salted by other means. Measurements were made of temperature changes within roasting meat, frying and boiling fish, cooking joints of meat, warming and cooling wine, and egg being boiled, and cooking soup stock.
Reprinted

2.3 (1.85) SHRIMP-PEELER APPARATUS

Willis, John C. (Juneau, Alaska) (assignor to Alaska Peelers, Inc., Seattle, Wash.) U.S. Patent 3,576,047 (April 27, 1971)

The object of this invention is to cause cooked shrimp to travel in sequence, one after the other, head first down a conveyor belt to a mechanical peeler.
LB

3.15 (2.05)

death in animals protected with individual antitoxins, A, B and E, and the symptoms exhibited by injected mice), it was concluded that this portion contained Type A botulinum toxin. None of the portions treated with gamma rays at a level of 100 Krad and none of the untreated samples produced symptoms of botulism in mice when extracts were injected. The dose rate of the Mark II cobalt^{60} source was determined. This was done in such a manner that the same mass was present in the irradiation chamber as when fish fillets were irradiated in quantities of 20 pounds (two 10 pound containers) and as the 100 gram portions were irradiated for the experiments reported herein. (auth)
Reprinted

3.12 IMPROVED FREEZE-THAW STABILITY

Yoder, D. J.; W. W. Bugg; General Foods (pat.)
U.S. Patent 3,554,764
Food Technology 25, No. 5, 54 (May 1971)

Thickening mixtures containing precoagulated wheat flour, gum, and sodium stearyl fumarate are added to food products. Such products have improved freeze-thaw stability.
FTP

2.9 POISONOUS FISH AND THEIR TOXINS (0.4)

Cheymol, Jean (Fac. Med., Paris, France)
Chemical Abstracts 74, No. 11, 51713v (March 15, 1971)

3.11 FOOD COATINGS

Whitman, G. R.; H. Rosenthal; General Foods (pat.)
U.S. Patent 3,556,814
Food Technology 25, No. 5, 62 (May 1971)

Foods are coated with a thermoplastic, edible composition consisting of 10-50% gelatin and 10-50% of a polyhydric alcohol (propylene glycol, glycerine, or sorbitol and mixtures thereof). Water may be present but in an amount not greater than 5%.
FTP

2.9 ORGANIC MERCURY IDENTIFIED AS THE CAUSE OF POISONING IN HUMANS AND HOGS

Curley, August, Vincent A. Sedlak, Edward F. Girling, Robert E. Hawk, and W. F. Barthel (Food and Drug Administration, Atlanta Toxicology Branch, Chamblee, Ga. 30341), Paul E. Pierce and William H. Likosky (Center for Disease Control, Viral Diseases Branch, Epidemiology Program, Atlanta, Ga. 30333)
Science 172, No. 3978, 65-67 (April 2, 1971)

This article reports the first documented case in the United States of indirect mercury poisoning in humans caused by the ingestion of contaminated meat from animals (hogs) that had consumed mercury in their food (wheat seed) supply. Mercury was found in the organic extracts of wheat seed grain and in the hogs fed the contaminated grain. Also, mercury was found in the urine, serum, and cerebrospinal fluid of humans who ate the contaminated pork.
[1 figure, 1 table, 13 references]
FTP

2.3 (1.85) NOTES ON FISH AND SHELLFISH

Hardy, E.
Cann. Pckg. 41, No. 475, 7 (1971)
BFMIRA Abstracts 24, No. 5, Abstract No. 1345, 287 (May 1971)

In this part of a long series of articles, the author described the different methods used to preserve freshly trawled prawns at sea. Undesirable changes caused by incorrect handling are briefly discussed. An Australian prawn processing and grading machine is described. L.P.
Reprinted

3.15 (2.05) GROWTH CHARACTERISTICS OF TYPE E CLOSTRIDIUM BOTULINUM IN THE TEMPERATURE RANGE 34 TO 50° F.

Anonymous
Final Report, January 15, 1969-January 14, 1970, 59 pp. (February 24, 1970). Contract AT(11-1)-1183 (Metal Div. Research and Development, Continental Can Co., Inc., Chicago, Ill.) Available from the National Technical Information Service, Operations Division, Springfield, Va. 22151. Order No. COO-1183-32, price on request.
Nuclear Science Abstracts 25, No. 7, 1329 (April 15, 1971)

In a second inoculated pack study on fresh cod, the following combinations of inoculation dose, incubation temperature, and radiation dose yielded the following results. When inoculated with spores of Clostridium botulinum at 10^6 spores/g and incubated at 46° F after exposure, samples given radiation doses of 0, 100, and 200 Krads showed Type E toxin development at 3/4 X (6 days), 1/2 X (7 days), and X (15 days). The value of X in days is the maximum product storage life of the sample as determined by a consumer panel. When inoculated with 10^4 spores/g, the same radiation doses and incubation temperature resulted in values of 1-1/2 X (12 days), 3/4 X (10 days), and X (15 days). Samples inoculated with 10^4 spores and incubated at 50° F following irradiation, showed Type E toxin development at 3/4 X (6 days), 1/2 X (7 days), and 3/4 X (11 days) following doses of 0, 100, and 200 Krads. At 10^2 spores/g these same radiation doses gave values of 1-1/4 X (10 days), 1/2 X (7 days), and 3/4 X (11 days) at 50° F. Cultural studies were conducted on marine isolates of Cl. botulinum type C. The following factors were investigated: growth and sporulation on Egg Meat Medium; effects of preheat treatment on viable spore count; sugar fermentation ability; effects of $NaHCO_3$ on spore

3.231 THE TWO-PIPE SYSTEM WORKS

Nussbaum, O. J. (Halstead & Mitchell Division of Halstead Industries, Zelienople, Pa.)
RSG Refrigeration Service and Contracting 39, No. 5, 18-20, 22-23 (May 1971)

A two-pipe vapor cycle, hot gas defrost system has been laboratory tested, and one commercial installation has been operating since the fall of 1970. The two-pipe concept offers the advantages of the hot gas defrost systems without cumbersome reevaporators or a superfluous hot gas line. Furthermore, it provides fast automatic hot gas defrost, eliminates liquid floodback hazard, and protects the compressor from overload during defrosting and during refrigerating.
[3 figures, 6 references] FTP

3.15 (3.2494) EFFECTS OF MICROWAVES ON BACTERIA IN FROZEN FOODS

Madson, Raymond A., Joseph T. Cordaro, Ronald L. Koller, and Gary E. Voelker (School of Aerospace Medicine, Brooks, AFB, Tex.)
Final Rept. 15 Sep 69-23 May 70, Rept. No. SAM-TR-70-87, 13 pp. (November 1970) Available from the National Technical Information Service, Operations Division, Springfield, Va. 22151. Order No. AD-717 853, PC$3.00, microfiche 95¢.
Government Reports Announcements 71, No. 6, 37 (March 25, 1971)

The effects of freezing and microwave heating on deliberately contaminated precooked frozen meal components were studied. Freezing conditions and food type appeared to influence survival of Escherichia coli as time increased, but Streptococcus faecalis exhibited no apparent change. Twenty-seven groups of samples representing 17 different foods were analyzed. The results suggest that the microwave heating will satisfactorily kill or reduce incidental and introduced microorganisms to a safe level providing the microwave exposure time is correlated with the size and type of food substance being treated. (Author) Reprinted

3.231 REFRIGERATOR FOR TROPICAL COUNTRIES

Industrie A Zanussi SpA, Via Vontereale, 8-Pordenore, Italy (pat.)
British Patent 1,211.274
Refrigeration and Air Conditioning 74, No. 876, 73 (March 1971)

The system contains a blower arrangement to ensure uniform distribution of cold air in the refrigerator designed for use in a tropical country. FTP

3.231 REFRIGERATED STORAGE

Coppel, Georges Saint-Ouen (93), France (pat.)
British Patent 1,213,577
Refrigeration and Air Conditioning 74, No. 876, 73 (March 1971)

Use of CO_2 to store foods under refrigeration requires the use of thick coated concrete walls. This patent covers the design of an all plastic storage chamber. FTP

3.231 DISPLAY CASE
(3.24)

Dual Jet Refrigeration Co., Chicago, Ill. (pat.)
British Patent 1,216,038
Refrigeration and Air Conditioning 74, No. 876, 73 (March 1971)

A refrigerated display case has been developed that contains an insulated side which can be fastened magnetically to the open side during the night (when the case is not being used for display purposes). FTP

3.231 INSULATED CASING

Stifer SpA, Pomezia-Rome, Italy (pat.)
British Patent 1,213,086
Refrigeration and Air Conditioning 74, No. 876, 73 (March 1971)

The insulated casing is used to make a refrigerator. It consists of a one-piece interior, a multipart exterior of plates,and grooved bars, and foam plastic between the two layers. It can be assembled by unskilled labor. FTP

3.15 PROPOSED METHOD FOR TESTING THE POSSIBILITY OF A BOTULISM HAZARD
(2.05) IN RADIATION-PASTEURIZED FISH

Ronsivalli, L. J., and M. S. Schwartz (Bureau of Commercial Fisheries, Gloucester, Mass.), and J. T. R. Nickerson (MIT, Cambridge, Mass.)
Isotop. Radiat. Technol. 8, 211-218 (1970-71)
Nuclear Science Abstracts 25, No. 8, 1619 (April 30, 1971)

The promise of economic savings from the use of ionizing radiation to preserve fish is weakened by the uncertainty as to whether or not this treatment allows botulinum Type E toxin to develop before the consumer rejects the product because of obvious spoilage. The test proposed here compares the specific time at which the consumer can detect spoilage in either irradiated or nonirradiated fish with the specific time at which toxin develops in the products. The available data indicate that this test can determine whether or not a botulism hazard exists. (auth) Reprinted

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3.15 (2.05)

recovery with Beef Infusion agar; Type C toxin production on different media; effects of trypsin on toxin activation; low temperature growth ability; sodium chloride sensitivity of strains; pH sensitivity of strains; and heat resistance of spores. (E.R.B.) Reprinted

3.2345 SOME CONSIDERATIONS ABOUT FREEZING RATE

Stepkowski, A.
Chlodnictwo 4, No. 12, 275-276 (1969) (In Polish)
BFMIRA Abstracts 24, No. 5, Abstract No. 1425, 302 (May 1971)

The author discusses the importance of freezing rate on the quality of frozen foods. Some foods can be harmed by using too rapid or too slow a freezing rate. The freezing rate should be high enough to destroy micro-organisms and prevent enzymatic activity. This usually varies from 0.1 cm/h to 5 cm/h. H.M.S.
Reprinted

3.231 GRILLE
(3.24)

Streater Industries Inc., Albert Lea, Minn. 56007 (pat.)
British Patent 1,123,258
Refrigeration and Air Conditioning 74, No. 876, 73 (March 1971)

This air return grille for an air curtain refrigerated display case increases the efficiency of the refrigeration system. FTP

3.2349 DENATURATION OF ENZYME PROTEIN BY FREEZE-THAWING AND
(0.321)(0.38) FREEZE-DRYING

Hanafusa, Naofumi (Inst. Low Temp. Sci., Hokkaido Univ., Sapporo, Japan)
Chemical Abstracts 74, No. 5, 19759d (February 1, 1971)

3.15 FOOD PRESERVATION WITH IONIZING RADIATION.
ACTION OF ENZYMES

Venosa, Francesco

Ind. Aliment. 5, No. 25, 52-58 (October 1966) (Pinerolo, Italy) (In Italian)
Nuclear Science Abstracts 25, No. 7, 1329 (April 15, 1971)

The present state of knowledge in the area of food preservation by ionizing radiations was summarized. The types of radiation used and the effects of radiation on microorganisms and insects in the preservation of meats, fruits, and grains were considered. The economic aspects of this process are also indicated. (J.S.R.) Reprinted

3.29 (3.15)(2.8) STUDIES ON THE COMBINED EFFECT OF GAMMA RADIATION AND COOKING ON THE NUTRITIONAL VALUE OF FISH

Kennedy, T. S., and F. J. Ley (Health Physics and Medical Division, Atomic Energy Research Establishment, Harwell, Berkshire, England)
Journal of the Science of Food and Agriculture 22, No. 3, 146-148 (March 1971)

The purpose of this study was to determine the effect of gamma irradiation and cooking (in combination) on the nutritive value of fish fillets. Cod fish were used; the irradiation dose was 0.6 Mrad. The control and irradiated fish samples were stored in crushed ice before cooking. Four distinct sample groups of fillets were prepared and examined: raw (control), irradiated raw, cooked (not irradiated), and irradiated cooked. Cooking consisted of heating the fillets in a pressure cooker for 4 min. at 15 lb./in.^{2} pressure. Microbiological methods for assay of nicotinic acid, riboflavin, and thiamine were carried out. The protein nutritive value was determined by the method of J. E. Ford [British Journal of Nutrition 14, 485 (1960)].

Protein nutritive value was unaffected by irradiation, but cooking caused a 9% loss (prior irradiation treatment did not increase this loss caused by cooking). The nicotinic acid content was not affected by irradiation but cooking caused a 4% loss (again prior irradiation did not increase this cooking loss). The riboflavin content was reduced 6% by irradiation, 9% by cooking, and 16% by both treatments. Thiamine content was reduced 47% by irradiation, 10% by cooking, and 54% by the combined treatment.

[2 tables, 31 references] FTP

3.3344 (2.00) BLUEING OF PROCESSED CRAB MEAT. II. IDENTIFICATION OF SOME FACTORS INVOLVED IN THE BLUE DISCOLORATION OF CANNED CRAB MEAT (CALLINECTES SAPIDUS)

Waters, Melvin E. (National Marine Fisheries Service Fishery Products Technology Laboratory, NOAA, Pascagoula, Miss. 39567)
Special Scientific Report--Fisheries No. 633, 7 pp. (May 1971) (U.S. Department of Commerce, NOAA, National Marine Fisheries Service, Seattle, Wash. 98115)

Iron is involved in the blue discoloration of canned crab meat. A buffered (pH 6.5-6.8) solution of citric acid prevented the formation of the blue color in the canned crab.

Factors that had no effect on the development of blue discoloration on the canned crab meat were: (1) method of exhausting (by use of vacuum pump or by heating the unsealed cans) the cans, (2) use of a parchment liner, (3) use of plant water, (4) use of dead or almost dead crabs, and (5) use of certain metallic ions other than Fe^{++} and Fe^{+++}.

[1 figure, 3 tables, 7 references] FTP

4.4 LACTONES PRODUCED THROUGH THERMAL OXIDATION OF HIGHER FATTY ACIDS

Watanabe, Kenji, and Yasushi Sato (Laboratory of Food Science and Technology (Animal Products), Faculty of Agriculture, Nagoya University, Nagoya, Japan)
Agricultural and Biological Chemistry 35, No. 2, 278-281 (February 1971)

In previous studies the authors identified γ- and δ-lactones in the volatile components of heated beef and pork fats. Furthermore, they demonstrated two mechanisms by which lactones could be formed: (1) production of lactone from the corresponding hydroxy acid in glycerides and (2) the production of lactone by conversion of the lower saturated fatty acids, aldehydes, and alcohols (these compounds are formed during the oxidative degeneration of the fats). The purpose of the present study, was to determine whether lactones were also formed from the higher fatty acids--the main components of meat fats.

Lactones, particularly γ-lactone, were produced during thermal oxidation of higher fatty acids [oleic ($C_{18}^{=}$), stearic (C_{18}), palmitic (C_{16}), and myristic (C_{14}) acids]. Lactones having carbon chains longer than 10 were not produced from oleic acid or myristic acid. Total yields of lactones were: from oleic acid, about 4 mg. per 150 g. of fatty acid preparation; from stearic acid, about 4 mg.; from palmitic acid, about 2 mg.; and from myristic acid, about 2 mg. The yields of lactones were low compared to that of volatile fatty acids. The yields of volatile fatty acids were: from oleic acid, about 2.0 g. per 150 g. of higher fatty acid preparation; from stearic acid, about 1.2 g.; from palmitic acid, about 1.0 g.; from myristic acid, about 0.8 g.

[2 figures, 2 tables, 10 references] FTP

4.5 ROLE OF THE BASES AND PHOSPHORYL BASES OF PHOSPHOLIPIDS IN THE AUTOXIDATION OF METHYL LINOLEATE EMULSIONS

Tsai, Lee-Shin, and Lloyd M. Smith (Department of Food Science and Technology, University of California, Davis, Calif. 95616)
Lipids 6, No. 3, 196-202 (March 1971)

Autoxidation of phospholipids is far more complicated than that of the neutral triglycerides. In this study, the authors explored the effects of functional groups of the phosphoryl bases of phospholipids on the autoxidation of unsaturated lipids in aqueous emulsion. Methyl linoleate, emulsified in borate buffer with sodium lauryl sulfate, was used. The pro- or antioxidant effects of the following compounds were examined: O-phosphocholine, choline, O-phosphoethanolamine, ethanolamine, O-phosphoserine, and serine. These particular phosphoryl bases were selected because they are the phosphoryl bases of the glycerol phospholipids most widely distributed in nature and because of their similarity in chemical structure. Oxygen uptake was determined from rate data obtained at 37° C. with an oxygen electrode.

The phosphoryl base and corresponding nonphosphoryl base gave similar results. Oxygen absorption by methyl linoleate emulsion was little affected by the addition of O-phosphocholine and choline at pH 7.9 or 10.2. O-Phosphoethanolamine and ethanolamine significantly increased oxygen uptake by methyl linoleate emulsion at pH 7.9, but they significantly decreased the uptake at pH 10.2. O-Phosphoserine and serine decreased oxygen absorption at pH 7.9 and 10.2.

Apparently, the catalytic activities of these bases may be attributed to their functional groups. The phosphoryl and β-hydroxy groups showed no catalytic

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4.64 (6.190) INFLUENCE OF RESIDUAL LIPIDS ON THE NUTRITIVE VALUE OF FISH MEAL. I. EFFECTS OF ADDING 1,2-DIHYDRO-6-ETHOXY-2,2,4-TRIMETHYL-QUINOLINE TO FISH MEAL ON PROTEIN QUALITY, ENERGY VALUE, AND VITAMIN E STATUS IN CHICKENS

Opstvedt, J., S. Olsen, and N. Urdahl (Norw. Herring Oil Meal Res. Inst., Bergen, Norway)
Chemical Abstracts 74, No. 7, 29585h (February 15, 1971)

4.64 (5.7) INFLUENCE OF RESIDUAL LIPIDS ON THE NUTRITIVE VALUE OF FISH MEAL. II. EFFECTS ON CARCASS COMPOSITION AND ORGANOLEPTIC QUALITY OF DIFFERENT LEVELS OF ANTIOXIDANT STABILIZED AND UNSTABILIZED FISH MEAL IN BROILER DIETS WITH AND WITHOUT ADDED VITAMIN E

Opstvedt, J., E. Nygard, and S. Olsen (Norw. Herring Oil Meal Res. Inst., Bergen, Norway)
Chemical Abstracts 74, No. 7, 29586j (February 15, 1971)

4.5

activity in the autoxidation of methyl linoleate emulsions at pH 7.9 or 10.2; the α-carboxylamino group of O-phosphoserine and serine decelerated autoxidation at the same two pH values; the amino group $H_3\overset{+}{N}$ of the primary amine accelerated autoxidation, but H_2N: group had the reverse effect. Because the quaternary amino group $(CH_3)_3\overset{+}{N}$ did not affect autoxidation at pH 7.9 or 10.2, the authors concluded that the presence of the N-H bond may be necessary for the prooxidant activity of an amine, and that the presence of a pair of free electrons on the nitrogen of an amine is necessary for its antioxidant activity.
[4 figures, 2 tables, 23 references] FTP

4.64 OIL ANTIOXIDANTS

ITT Rayonier Inc. (pat.)
British Patent 1,211,784
Food Technology 25, No. 5, 56 (May 1971)

The antioxidants for animal and vegetable fats consist of mixtures of phlicatic and thiodipropionic acids. FTP

3.239 (3.2490)(1.51) CHANGES IN THE EATING QUALITY OF FROZEN STORED COD AND ASSOCIATED CHEMICAL AND PHYSICAL CHANGES

Connell, J. J. (Torry Res. Sta., Min. Technol., Aberdeen, Scotland)
Chemical Abstracts 74, No. 1, 2791k (January 4, 1971)

3.63 PORE SIZE EFFECT IN THE FREEZE DRYING PROCESS

Stuart, Edward B., and Gerard Closset (Chemical and Petroleum Engineering Department, University of Pittsburgh, Pittsburgh, Pa. 15213)
Journal of Food Science 36, No. 3, 388-391 (April 1971)

The purpose of these experiments was to determine the influence and effect of the structure of dried beef muscle on heat and mass transfer rates. The object of this study was to relate the thermal conductivity and the structure of the dried material; thus determining the influence of the individual conductivities of the solid tissue and pore space on the overall thermal conductivity which controls the drying rate. The drying rates were measured in the usual operating range of commercial freeze driers (from 0.2 to 3.0 mm. Hg pressure range). The thermal conductivities of the dried beef and the heat and mass transfer were calculated from the drying rate data; the structure of the freeze-dried beef was examined by optical means. The authors derived a simple relationship between thermal conductivity and pore structure. Apparently, drying rates are related to basic transport properties, thermal conductivity, and pore structure.
[6 figures, 1 table, 12 references] FTP

4.21 THE AUTO-OXIDATION OF FATS. NOTE 1 - THE INFLUENCE OF FREE FATTY ACIDS

Catalano, M., and M. de Felice
Riv. ital. Sost. grasse 47, No. 10, 484-492 (1970) (In Italian, English summary)
BFMIRA Abstracts 74, No. 4, Abstract No. 1023, 221 (April 1971)

During the course of an investigation on olive, coconut and palm oils, it was shown that all free fatty acids caused oxidation, even when present at a level as low as 0.5%. The oxidative activity was not evident when the acids were present in the form of esters or salts. The effectiveness of antioxidants was reduced by the oxidative activity was concluded to be derived from the carboxyl group. C.C.

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3.4 SMOKE COLOR

Groenen, P. J.; Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van de Voeding (pat.)
Canadian Patent 859,664
Food Technology 25, No. 5, 54 (May 1971)

Foodstuffs are given a smoked color by treatment with gamma-dicarbonyl compounds (for example, laevulinic aldehyde diethylacetal). FTP

4.81 ANTISPATTERING OILS
(2.8)

Dobson, R. D., L. H. Going, E. R. Purves; Procter & Gamble (pat.)
Canadian Patent 859,667
Food Technology 25, No. 5, 56 (May 1971)

About 0.1 to 1.0% by weight of an acid-treated unsaturated fatty acid ester of polyoxyethylene sorbitan is added to cooking and salad oils. FTP

4.81 ANTISPATTERING OILS
(2.8)

Dobson, R. D., L. H. Going, E. R. Purves, and R. G. Cunningham; Procter & Gamble (pat.)
Canadian Patent 859,668
Food Technology 25, No. 5, 56 (May 1971)

The antispattering agents for cooking and salad oils consist of mixtures of acid-treated unsaturated fatty acid monoesters of polyoxyethylene sorbitan and unsaturated fatty acid polyesters of polyglycerol. FTP

4.82 EFFECT OF DIETARY FISH OIL ON THE FATTY ACID COMPOSITION AND PALATABILITY OF PIG TISSUES

Kifer, Robert R., and Preston Smith, Jr. (National Marine Fisheries Service, Washington, D.C. 20235), and Edgar P. Young (Department of Animal Science, University of Maryland, College Park, Md. 20740)
Fishery Bulletin 69, No. 2, 281-302 (April 1971)

Pigs were fed diets containing fish (menhaden) oil in two feeding trials to investigate (1) the organoleptic effect produced in pig tissue by feeding pigs stabilized crude menhaden oil; (2) the possible retention or disappearance of off-flavor by withdrawing the fish oil from the diet at given times; (3) the nature of the fatty acid composition of the inner backfat tissues, the outer backfat tissues, the liver tissues, and the longissimus dorsi tissues; (4) the relation of composition to off-flavor (if an off-flavor is produced); and (5) the hypothesized metabolic interactions of fatty acid families.

The meat of pigs fed diets containing about 1% of menhaden oil had an off-flavor and a fishy flavor. Up to 28 saturated and unsaturated fatty acids were present in tissues; unsaturated fatty acids from four of the fatty acid families (ω3, ω6, ω9, and ω7) were present in each of the tissues. The quantity of the characteristic fatty acids (ω3) of the fish oil fed correlated significantly and positively with the quantity of these fatty acids deposited in the inner backfat tissues and the outer ones and the liver tissues, but not in the longissimus dorsi tissues. The quantity of these ω3 fatty acids fed correlated significantly and positively with a weighted organoleptic score of the inner backfat tissues; removal of these fatty acids from the diet of the pigs at two different body weights

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4.90 FATTY ACID COMPOSITION OF LIPIDS FROM BROILERS
(0.7) FED SATURATED AND UNSATURATED FATS

Schuler, George A., and E. O. Essary (Department of Food Science and Technology, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061)
Journal of Food Science 36, No. 3, 431-434 (April 1971)

Tallow (a saturated fat) and safflower oil (an unsaturated fat) were fed to broilers in order to determine what influence each of these types of fats had on the possible change in fatty acid composition of lipids deposited in the tissues of the broilers. The broilers were examined at biweekly intervals from 4 to 10 weeks of age. Fatty acids from raw skin, cooked skin [the skin from the neck and third wing joint was excluded], breast meat, thigh meat, and abdominal fat were determined by gas-liquid chromatography. Also, the fatty acids in the water in which the carcasses were cooked were identified.

The degree of unsaturation of the fatty acids in the stated tissues was influenced by the type of fat (thus, the degree of unsaturated fatty acids in the diet) and tended to reflect the fatty acid composition of the diet. For some of the broilers, however, the higher levels of certain fatty acids in depot fat was not evident in broilers fed the higher levels of unsatutated fatty acids in the diet. Palmitic, stearic, oleic, and linoleic acids predominated in all the broiler tissues but the amount varied among the different age broilers. Generally, there was an inverse relation between the amount of oleic acid and the amount of linoleic acid in the tissues. The lipids from the cooked tissues contained more 18-carbon unsaturated fatty acids than all the other fatty acids combined. The fatty acids in the cooking water were similar to those in the cooked tissues. The

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5.1 VITAMIN A DEFICIENCY EFFECT ON RETINA: DEPENDENCE ON LIGHT

Noell, W. K., M. C. Delmelle, and R. Albrecht (Neurosensory Laboratory, State University of New York at Buffalo, 2211 Main Street, Building C, Buffalo, N.Y. 14214)
Science 172, No. 3978, 72-76 (April 2, 1971)

Previous workers have examined the effect of nutritional vitamin A deficiency upon the retina of the albino rat and have found that night blindness, the first sign of tissue deprivation, is directly related to the loss of vitamin A aldehyde from the visual pigment. Furthermore, destruction of the structure of the outer rod segment took place in conjunction with a decrease in the protein component of the visual pigment, and a substantial fraction of the visual cell population seemed to undergo lysis and disappear. In the present study, the authors reinvestigated the effects of vitamin A deficiency on the rat retina in conjunction with experiments designed to elucidate the role of vitamin A in the damage produced by visible light.

The effects of vitamin A deficiency in the eye of the albino rat (as measured by the electroretinogram and changes in the rhodopsin content) are critically dependent upon the levels of illumination to which the animals are exposed daily. Vitamin A deficient animals kept in darkness maintained practically normal electroretinogram function and rhodopsin content for 5 to 6 months; those rats kept in weak cyclic light lost rhodopsin continuously. Apparently, a fraction of the retinol released from rhodopsin during illumination disappears, probably from the pigment epithelium into the blood, and becomes unavailable for regeneration of rhodopsin. Light environment plays an important role not only in vitamin A deficiency but also normally in the biology of visual cells and pigment epithelium. [6 figures, 28 references] FTP

7.879 (6.134) MOISTURE MEASUREMENT IN THE FOOD INDUSTRY. AN INFRA-RED ABSORPTION TECHNIQUE

Swift, J. R. Ed Trade Rev. 41, No. 1, 25-26 (1971)
BFMIRA Abstracts 24, No. 4, Abstract No. 986, 212 (April 1971)

An infra-red absorption technique has been successfully used to measure the moisture content of instant coffee, fish meal, confectionery granules, dried potato granules, moulding starch, breadcrumbs and dried soup powders. D. B.

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4.90 (0.7)

tissues of 4-week-old broilers contained 13- and 25-carbon chain fatty acids--the authors state that this observation suggests a difference in the metabolism of fat in broilers of different age, but that further work is necessary to substantiate this observation.
[4 tables, 7 references] FTP

4.82

--namely, 68.0 and 79.5 kg--prior to their being marketed at 90.9 kg resulted in a loss of significant positive correlation.

On a practical basis, if fish oil (having similar fatty acid composition to the one used in the present tests) is used to feed pigs up to the time when they are marketed, then the amount of fish oil in the diet should not exceed 0.8%. However, if the fish oil is withdrawn from the diet at an appropriate time before the pigs are marketed, higher levels of fish oil can be fed to the pigs.
[27 tables, 32 references] Reprinted in part

5.1 IRREVERSIBLE EFFECTS OF VISIBLE LIGHT ON THE RETINA: ROLE OF VITAMIN A

Noell, W. K., and R. Albrecht (Neurosensory Laboratory, State University of New York at Buffalo, Buffalo, N.Y. 14214)
Science 172, No. 3978, 76-79 (April 2, 1971)

Earlier workers found that diffuse irradiation by visible light (at intensities that are normally encountered) produces in the retina of the rat death of visual cells and pigment epithelium. The damage is a function of irradiation intensity and exposure time; an environment illuminated by fluorescent light at 1,500 lux through a green filter produces severe damage when continued for 40 hours. This article reports on experiments designed to determine the role of vitamin A (retinol) in the mechanism of this damage.

The authors found that vitamin A deficiency protects against this damage (in the rat) but that the retinol released by light from rhodopsin is probably not the toxic agent. They conclude that the major factor determining the procection against damage by light is a state of "cell adaptation" to light itself. The retinol deficiency provides this protection because it develops as a function of light, producing a steady state of adaptation that can be reversed by the administration of retinol but not by darkness. Damage by visible light probably is the result of a reaction to the sudden and prolonged step of cell activity from a level of functioning in the dark or weak light to one in strong light. Possibly, the mammalian visual cell is a metastable, highly differentiated cell, and its cellular activities are delicately balanced for survival. The main result of their analysis, the authors state, is the recognition that this balance may intricately depend upon the diurnal cycle of light and darkness.
[5 figures, 1 table, 22 references] FTP

4.81 MARGARINE COMPOSITIONS

Unilever (pat.)
British Patent 1,212,720
Food Technology 25, No. 5, 56 (May 1971)

Margarines having good spreading properties and low oil exudation are prepared from an interesterified mixture of liquid fat blended with a hardened fat. FTP

4.81 (2.8) ANTISPATTERING OILS

Purves, E. R.; Procter & Gamble (pat.)
Canadian Patent 860,886
Food Technology 25, No. 5, 56 (May 1971)

The antispattering agents consist of mixtures of acid-treated unsaturated fatty acid monoesters of polyoxyethylene sorbitan and unsaturated polyesters of polyglycerol. FTP

4.21 NEW METHODS IN THE STUDY OF REACTION MECHANISMS

AUTO-OXIDATION OF LIPIDS.

Mechanisms of formation of methyl oleate. C.C.

Reprinted

auto-oxidation of hydroperoxides were investigated by studying the

Pallotta, U., M. V. Piretti, and P. Capella (Un Italian, English summary) (April 1971) 222 pp.
Riv. Ital. Sost. Grasse 47, No. 4, Abstract No. 1025, 472-483 (1970) (In Italian, English summary)
BFMIRA Abstracts 24, No. 10, 2

6.14 (0.5) DEATH RATES OF SALMONELLAE IN FISHMEALS WITH DIFFERENT WATER ACTIVITIES. I. DURING STORAGE

Doesburg, J. J. (present address: Institute of Fishery Products TNO, IJmuiden, The Netherlands), and E. C. Lamprecht, and M. Elliott (Fishing Industry Research Institute, University of Cape Town, Rondebosch, South Africa)
Journal of the Science of Food and Agriculture 21, No. 12, 632-635 (December 1970)

The survival of salmonellae in inoculated, antioxidant treated, anchovy meal, pelletized and nonpelletized, stored in air and under nitrogen, was determined. The full anchovy meal that was used contained, on the dry basis, 75.2% crude protein and 12.7% fat; the moisture content was 10.9%. The antioxidant ethoxyquin (1,2-dihydro-6-ethoxy-2,2,4-trimethylquinoline) was added in the amount of 400 p.p.m. to the meal immediately after production of the meal. Portions of the meal were moistened or dried to achieve three general levels of moisture content of 12.1 and 12.3%, 8.0 and 8.4%, and 4.9%. The anchovy meal samples with these different moisture contents, having water activities (a_w) ranging from 0.34 to 0.71, were inoculated with strains of Salmonella oranienburg or S. senftenberg and were stored at 15°, 20°, and 30° C. packed in air or in nitrogen. Total storage period was 230 days but was reduced for those samples that were Salmonellae-negative before the end of this time period. The initial death rates of the organisms were calculated over a period of 70 days.

The initial death rates of the Salmonellae were not appreciably influenced by reduction of a_w from 0.71 to 0.54; further reduction of a_w to 0.35 resulted in a decrease of the initial death rate, particularly in those meals stored at 15° or 20° C. The meals packed in nitrogen showed a decrease in initial death rates,
(over)

6.195 (9.6) AMINO ACIDS IN FISH MEALS

Anonymous
Fishing News International 10, No. 4, 56 (April 1971)

Early in 1970, E. L. Miller, of the University of Cambridge (England), was commissioned to prepare a review paper, "Available Amino Acid Content of Fish Meals," from some 10 years' collection of analytical data on various feedstuffs. The 66-page review is now available from FAO headquarters in Rome.

In the review, the author compares the data on fish meal with those on meat and soyabean meals. The mean percentage availability for lysine, methionine, and tryptophan in fish meals is 93, 97, and 103, respectively; in meat meals, it is 86, 75, and 77; in soyabean meals, it is 90, 101, and 103. The true digestibility value for the amino acids in fish meal is 91%; in meat meal, 71%; and in soyabean meal, 91%. The conclusion is that indigestibility is a major cause of incomplete availability. LB

6.14 (0.5) DEATH RATES OF SALMONELLAE IN FISHMEAL WITH DIFFERENT WATER ACTIVITIES. II. DURING HEAT TREATMENT

Doesburg, J. J. (Institute of Fishery Products TNO, IJmuiden, The Netherlands), and E. C. Lamprecht, and M. Elliott (Fishing Industry Research Institute, University of Cape Town, Rondebosch, South Africa)
Journal of the Science of Food and Agriculture 21, No. 12, 636-640 (December 1970)

In part I of this study, the authors found that pelletization of fish meal reduced the counts of Salmonellae inoculated in the product. Part II deals with the influence of different time-temperature combinations in fish meals (inoculated with Salmonellae) at different moisture contents. The initial count of Salmonellae was about 10^6/g. in the inoculated samples. The fish meals were heated in a microwave oven to temperatures at various intervals within the range of 50° to 85° C.

The death rate of salmonellae was not constant during heating of the fish meals, but it did decrease with time. For heat treatments at constant temperatures between the range of from 50° to 85° C., the initial death rates of salmonellae were the same in the meals with water activity (a_w) of from 0.58 to 0.89, but decreased in the meals with water activity below 0.58. The average death rate of S. oranienburg increased greatly in the meals with water activity values of from 0.40 to 0.80. The maximum heat resistance of S. senftenberg 775W occurred in the fish meal with water activity of 0.53.

The heat resistance in fish meal of S. oranienburg was greater than that of S. senftenberg 775W.

[4 figures, 1 table, 19 references] FTP

6.54 NEW PROCESS FOR LOW-COST, HIGH-PROTEIN BEVERAGE BASE

Mustakas, G. C., W. J. Albrecht, G. N. Bookwalter, V. E. Sohns, and E. L. Griffin, Jr. (Northern Agricultural Research Service, U.S. Department of Agriculture, Peoria, Ill. 61604)
Food Technology 25, No. 5, 80-84, 86 (May 1971)

An extrusion cooked full-fat soy flour is used to make a spray-dried beverage base. Water is added to the beverage base to form a nutritious drink. The production of full-fat soy flour involves the processes of cracking-dehulling, dry-heat preconditioning, moisture tempering, extrusion cooking, drying and cooling, and milling. Eighty-eight pounds of full-fat soy flour are produced from 100 pounds of soybeans. Production of the beverage base involves the processes of: mixing the full-fat soy flour with water, hydrogenated soybean oil, and emulsifier; colloid milling; homogenizing; spray drying; and, finally, blending the spray dried mix with sucrose, salt, flavoring, mineral mix, and vitamin mix. The formulated beverage base consists of: 74.3% full-fat soy flour; 15.0% hydrogenated soybean oil; 0.8% emulsifier; 6.9% sucrose; 0.8% salt; 0.2% flavoring; 1.9% mineral premix; and 0.1% vitamin premix. The chemical composition of the beverage base is: moisture, 2.0%; protein (Nitrogen × 6.25), 32.6%; crude fat, 29.5%; crude fiber, 1.4%; ash, 6.2%; and carbohydrate, 28.3%. FTP

6.19 NITROGEN METABOLISM OF THE PIG. III. UTILISATION OF PROTEIN FROM DIFFERENT SOURCES

Ostrowski, H., A. S. Jones, and A. Cadenhead (Department of Applied Nutrition, Rowett Research Institute, Bucksburn, Aberdeen AB2 9SB Scotland)
Journal of the Science of Food and Agriculture 22, No. 1, 34-37 (January 1971)

Young pigs (initial weight of 20 kg.) were fed diets containing different protein concentrates (meat and bone meal, white-fishmeal, soybean meal, or groundnut meal). The diets supplied similar amounts of available lysine, but different amounts of total lysine and total protein. The purpose of this study was to compare the nitrogen retention of growing pigs fed four diets containing different protein concentrates, but each diet providing the same concentration of available lysine and different concentrations of total lysine and total protein.

The pigs given the four different diets showed similar growth rates and efficiencies of food utilization. The results suggest that, within certain limits, most of the variability in the performance of genetically similar pigs may be due to differences in energy intake and available lysine intake. As a practical guide, the authors state, diets compounded from the normal ingredients available in Britain and containing not less than 13% nor more than 17% crude protein, should give equal performance in pig carcass quality if the diets are equated on the basis of available lysine and total digestible nutrients. If the diets are equated on the basis of total lysine or total protein, equal performance will not be achieved.
[6 tables, 10 references] FTP

6.54 PROTEIN FOODSTUFFS

Kweldam, A. C. (pat.)
British Patent 1,212,369
Food Technology 25, No. 5, 62 (May 1971)

Protein foods are cooked in water containing preservatives and flavorings. The cooked solids and the liquid are dried separately, then the dried materials are combined. FTP

6.54 SYNTHETIC CAVIAR

Nesmeyanov, A. N., S. V. Rogozhin, G. L. Slonimsky, V. B. Tolstoguzov, and V. A. Ershova; Institut Elementoorganicheskikh Soedinenу-Akademii Nauk USSR (pat.)
Canadian Patent 859,666
Food Technology 25, No. 5, 62 (May 1971)

The synthetic caviar granules consist of an aqueous solution or suspension of proteins, gelatin, and vegetable tanning agents (the tanning agents are mostly in the surface membrane layer of the granules). FTP

6.14 (0.5)

especially those with the lowest a_w values and stored at 15° and 20° C., when compared with the values obtained for the meals packed in air.

Pelletization of the meals (having a_w 0.72 to 0.74) caused a 10^{-2} to 10^{-3}-fold reduction of initial Salmonella counts (initial count was about 10^6 bacteria per gram). The death rates of those salmonellae that survived pelletization treatment were about the same as that of the salmonellae in nonpelletized meals (that is, comparing meals with similar a_w values).
[3 figures, 1 table, 7 references] FTP

6.34 (9.13) EXPERIMENTAL STUDY OF THE ACCUMULATION OF RADIONUCLIDES ^{90}Sr AND ^{144}Ce FROM SEA WATER BY ALGINIC ACID

Lazorenko, G. E., and G. G. Polikarpov (Inst. of Biology of the Southern Seas, Sevastopol, U.S.S.R.)
Dopov. Akad. Nauk Ukr. RSR, Ser. B, No. 5, 445-448 (May 1970) (In Ukrainian)
Nuclear Science Abstracts 25, No. 7, 1308 (April 15, 1971)

Alginic acid-polysaccharide obtained by extraction of brown algae is capable of accumulating ^{90}Sr and ^{144}Ce quickly from sea water to high concentration factors values (about 100 and 500 units, respectively). On the other hand, alginic acid does not accumulate ^{137}Cs, ^{65}Zn and ^{204}Tl. Correlation between concentration factors of ^{90}Sr and ^{144}Ce accumulation by alginic acid and their concentration factors in brown algae and high stability of alginic acid to external influences make it possible to assume that alginic acid or its compounds might take part in extraction of strontium and cerium by these algae from sea water. (auth)
Reprinted

6.193 CONVERSION OF THE NITROGEN OF FEED MIXTURES CONTAINING CONCENTRATES OF NITROGEN SUBSTANCES BY CALVES

Sramek, Jaromir, and Jan Plndak (Res. Inst. Cattle Breed., Rapotin, Czechoslavkia)
Chemical Abstracts 74, No. 9, 39938q (March 1, 1971)

6.134 DETERMINATION OF THE OPTIMUM CONDITIONS FOR WATER AND LIPID REMOVAL FROM FATTY FISH

Chung, Byung-Sun (Korea)
Chemical Abstracts 74, No. 9, 41192k (March 1, 1971)

7.42 (9.19) DETERMINATION OF SUBMICROGRAM QUANTITIES OF MERCURY IN LAKE WATERS

Chau, Yiu-Kee, and Hirohumi Saltoh (Canada Centre for Inland Waters, Burlington, Ontario)
Effluent and Water Treatment Journal 11, No. 3, 135-138 (March 1971)

A simple, sensitive method for the determination of submicrogram amounts of mercury in lake water was developed. It involves a combination of concentration by dithizone extraction and gas-phase atomic absorption. The mercury is extracted by dithizone, back extracted by hydrochloric acid, and then converted to vapor by a reduction-aeration reaction. Hg, Hg(I), and Hg(II) and some organomercuric compounds are extracted by the procedure. In the analysis of water, a sensitivity of 0.008 µg. per liter (0.008 p.p.b.) was achieved.
[2 figures, 1 table, 12 references] FTP

7.871 (4.5) DETERMINATION OF THE EXTENT OF RANCIDITY OF SOYBEAN OIL BY GAS CHROMATOGRAPHY COMPARED WITH PEROXIDE VALUE

Jarvi, P. K., G. D. Lee, D. R. Erickson, and E. A. Butkus (Swift and Company, 1919 Swift Drive, Oak Brook, Ill. 60521)
Journal of the American Oil Chemists' Society 48, No. 3, 121-124 (March 1971)

Because an objective instrumental method for evaluating the flavor quality of fats and oils would be useful, the authors examined the development of rancidity in soybean oil by use of gas chromatography (GC), peroxide value (PV), and sensory evaluation. Specifically, they attempted to correlate organoleptic (flavor) results with PV's and with oxidation values (OV) which were obtained by an improved GC method. They also used an improved sensory method (a ranking procedure) for evaluating the off-flavor of the oil. The GC method was adapted from an existing method, using another type of column packing [a 15% (w/w) Varian Aerograph FFAP stationary phase, on 90-100 Mesh Anakrom AB, was used.]. The GC peaks were treated as one entire group, and the OV was computed by means of an internal standard (n-octanol). A freshly deodorized 100% soybean oil and plant-deodorized blend of 50% soybean oil and 50% hydrogenated soybean oil were used. They were stored at 60° C. in darkness in closed jars for varying lengths of time.

The OV's correlated with the PV's. A relationship between the OV and the flavor of the fat was demonstrated.
[7 figures, 3 tables, 9 references] FTP

7.85 RAPID QUANTITATIVE METHOD FOR SALMONELLA DETECTION IN POLLUTED WATERS

Cheng, Chu Ming, William C. Boyle, and J. M. Goepfert (Department of Civil Engineering and Food Research Institute, Department of Bacteriology, University of Wisconsin, Madison, Wis. 53706)
Applied Microbiology 21, No. 4, 662-667 (April 1971)

A rapid and reliable method for the enumeration of salmonellae in water, waste water, and waste-water sludge is described. The procedure involves selective enrichment in m-Tetrathionate Broth (22 ± 1 hr.), plating on Brilliant Green Sulfa Agar (20 ± 1 hr.), and confirmation by flagellar (H) agglutination of the growth in a mannose-containing medium (6 ± 1 hr.). Incubation is at 45° C. Dilution extinction techniques (most probable number) are used to enumerate salmonellae. The samples are concentrated by use of membrane filters.
[8 tables, 13 references] FTP

8.8 (3.331) OBSERVACIONES SOBRE LA CALIDAD DEL ATÚN EN CONSERVA EN VENEZUELA
[OBSERVATIONS ON THE QUALITY OF TUNA CANNED IN VENEZUELA]

Tornes, E., P. George, and E. M. DelGallo
Informe Técnico No. 21, 19 pp. (1971) (In Spanish; English summary) (Chief of Publications, Library and Information Services, Fisheries Research and Development Project, Apartado 2578, Caracas, Venezuela)

Tuna is a relatively important raw material for the canning factories in Venezuela. Three main species of tuna are caught together with small quantities of four other related species, but no distinction is made between species during processing or on the tins. The processing aims at a product consisting of a solid transverse cut of the precooked fish, after removal of the skin, bones, and dark meat.

The report briefly refers to the international Codex Committee's proposed quality standards of canned tuna, and describes the results of the examination of 14 samples of canned tuna, produced at five different Venezuelan plants and purchased off the shelf. For comparison ten imported samples were examined [imported from United States, France, and Spain].

It was found that in ten of the nationally produced tins, net weight was lower than declared, which was also the case with four of the imported tins; however, the short weight in the imported tins was compensated by overweight in the remaining imported tins. Also, the weight of solid substance was variable, especially in samples of national production.

(over)

7.89 DETERMINATION OF RESIDUAL SOLVENT IN OILSEED MEALS AND FLOURS: III. ISOPROPANOL

Fore, S. P., E. T. Rayner, and H. P. Dupuy (Southern Regional Research Laboratory, Agricultural Research Station, U.S. Department of Agriculture, New Orleans, La. 70119)
Journal of the American Oil Chemists' Society 48, No. 3, 140-142 (March 1971)

In connection with a research study on the detoxification of mold damaged oilseed meals by isopropanol extraction, the authors had to determine the amount of residual isopropanol in the extracted meals. They developed a simple volatilization procedure for isopropanol in oilseed meals and flours based on a modification of the volatilization procedure used for determining hexane [H.P. Dupuy and S. P. Fore, JAOCS, 47, 231-233 (1970)] in oilseed meals. A modified Todd azeotropic distillation procedure [P. H. Todd, Jr., Food Technology 14, 301-305 (1960)] was used to check the accuracy of the volatilization method.

The method is as follows: Place a 1 g. sample in a 100 ml. serum bottle; add 200 µl. of distilled water containing 0.075 mg. of ethanol; and, then, seal the bottle with a rubber stopper. Heat the bottle and contents at 110° C. for 1 hr. Analyze a 2-ml. aliquot of the headspace gas by gas chromatography using the added ethanol as an internal standard.

The results obtained with the volatilization procedure for three cottonseed, two peanut, and two fish meals (which had been experimentally processed with isopropanol) ranged from 10 to 12,000 p.p.m. and compared favorably with the results obtained by the modified Todd azeotropic distillation procedure. The volatilization method requires less operator and gas chromatograph time per analysis than does the azeotropic distillation process.

[2 figures, 1 table, 3 references] FTP

7.463 DIRECT POTENTIOMETRIC DETERMINATION OF FLUORIDE IN WATER AFTER 8-HYDROXYQUINOLINE EXTRACTION

Ke, Paul J., and Lloyd W. Regier (Fisheries Research Board of Canada, Halifax Laboratory, Halifax, Nova Scotia, Canada)
Analytica Chimica Acta 53, 23-29 (1971)

Fluoride in natural and waste water is determined with a fluoride ion-specific electrode. A preliminary extraction is carried out to remove interfering polyvalent cations, as their 8-hydroxyquinoline complexes, into a butyl cellosolve-chloroform mixture. The method may be used directly for water samples containing fluoride in the range of from 0.2 to 6.0 p.p.m. with an overall error of less than 5%. The method can be used for determining fluoride in most polluted water samples that contain a high level of Ca, Mg, Fe, and Al ions.

[1 figure, 2 tables, 19 references] FTP

8.8 (3.331)

The general appearance when the tins were opened was found to vary greatly and of the national samples only two were classified as good, eight as fair or acceptable while four samples were considered as being below acceptable standards. A special problem is apparently the small size of some of the fish which makes them unsuitable for this type of pack; they should be made into simpler types, clearly separated from the luxury-type, "solid packing", for which only bigger fish should be used.

The taste and texture of some of the national samples indicated that the raw material had not been as fresh as desirable or the details of processing not well controlled.

Of the ten imported samples, six were found to have a good appearance and four samples were considered as fair with rather minor defects. Also taste and texture were good in practically all imported samples.

The oil used in some imported products was found to have a peculiar smell, and when olive oil was used, it had a typical smell and taste which were stronger than found in similar national products.

[5 figures, 2 tables, 4 references] Authors' summary

7.9 METHOD FOR MEASURING MINERALIZATION IN LAKE SEDIMENTS (9.19)(0.5)

Harrison, Michael J., Richard T. Wright, and Richard Y. Morita (Departments of Microbiology and Oceanography, Oregon State University, Corvallis, Oreg. 97331)
Applied Microbiology 21, No. 4, 698-702 (April 1971)

The report describes a method for measuring the mineralization of an organic solute (^{14}C-glucose) by heterotrophic indigenous bacteria in lake sediments. Because there is no suitable procedure for determining in situ microbial activities in sediments, the procedure described may be the best so far and may serve as a base for a more definitive procedure.

[5 figures, 12 references] FTP

7.9 LIQUID CHROMATOGRAPHY OF AFLATOXINS INCLUDING AFLATOXINS B_{2a} AND G_{2a}

Manabe, Masaru, and Shinji Matsuura (Food Research Institute, Ministry of Agriculture and Forestry, 1-4, Shiohama, Koto-ku, Tokyo, Japan)
Agricultural and Biological Chemistry 35, No. 3, 417-423 (March 1971)

The authors describe the separation of six kinds of aflatoxins (carcinogenic mycotoxins)--B_1, B_2, B_{2a}, G_1, G_2, and G_{2a}. They examined various kinds of absorbents and eluting solvents and obtained good separation of aflatoxins by using Sephadex G-10 (CM), an absorbent containing carboxymethyl group, and eluting with pure water. The aflatoxins were eluted in the following order: G_{2a}; B_{2a}; G_2; B_2; G_1; and B_1.

[7 figures, 1 table, 9 references] FTP

7.593 RAPID ENZYMIC METHOD FOR GLYCOGEN ESTIMATION IN VERY SMALL TISSUE SAMPLES

Hultin, Frans (Sch. Med., Univ. Miami, Miami, Fla.)
Chemical Abstracts 74, No. 9, 39066d (March 1, 1971)

8.8 PHOTOGRAPHY AS A MEANS OF DOCUMENTATION IN FOOD INSPECTION (9.3)(0.112)

Gemmer, H.
Fleischwirtschaft 51, No. 1, 53-55 (1971) (In German, English summary)
BFMIRA Abstracts 24, No. 5, Abstract No. 1248, 268 (May 1971)

The use of photography for documentation and examination of foods both macroscopically and microscopically is described. The detection of textured vegetable protein in meat products by the use of photography is also mentioned. C.S.B. Reprinted

9.3 COLIFORMS AND FECAL COLIFORMS IN OYSTER-GROWING AREA
(9.19)(0.5)

Presnell, Maynard W., and John J. Miescier (USPHS Gulf Coast Marine Health Sciences Laboratory)
Journal of Water Pollution Control Federation 43, No. 3, 407-416 (March 1971)

Some shellfish growing areas along the Gulf Coast cannot meet the bacteriological standards for shellfish growing areas established by the United States Public Health Service (USPHS). In certain of these areas, the high coliform and fecal coliform levels could not be attributed to wastes of human or domestic origin. The purpose of the present study was to determine the levels of coliform and fecal coliform bacteria in polluted and unpolluted waters and soils adjacent to and relatively remote from Graveline Bayou (Mississippi) and, if possible, to determine the sanitary significance of these organisms. In addition, the researchers also examined soil samples from selected polluted and unpolluted areas for salmonellae and determined the levels of coliforms, fecal coliforms, and salmonellae in certain wild birds and mammals from the Graveline Bayou area.

High levels of coliform and fecal coliform organisms were found in samples of soil and of water collected both from polluted stations and from unpolluted (based on sanitary survey) stations. Apparently soils in both polluted and unpolluted areas serve as reservoirs that contribute to the coliform and fecal coliform bacteria content of adjacent waters during periods of increased runoff or when high tides cover the low-lying areas. On the basis of current USPHS bacteriological standards, the MPN (most probable number) of coliform organisms at the polluted and the unpolluted stations were great enough that the waters would have been classified as unsuitable for harvesting of oysters for direct marketing.

(over)

9.3 THE SOVIET UNION AND THE LAW OF THE SEA
(9.4)(9.2)

Butler, William E. (University of London, London, England)
Johns Hopkins Press, Baltimore, Md., U.S.A., 245 pp. (1971)

This book examines the origins and development of prerevolutionary Russian and Soviet doctrines and practices relating to aspects of the public international law-of-the-sea--the legal regimes of territorial waters, interval sea waters, closed seas, Continental Shelf, deep seabed, and high seas. The book suggests that the Soviet approach is immensely more complex, traditional, sophisticated, and community-oriented than previously believed. The author attached considerable importance to the Russian heritage for an understanding of attitudes and policies during the Soviet era and he shows the need for distinguishing carefully between doctrine and practice in appraising Soviet international legal positions. The book contains a large body of legal data on Soviet behavior not generally accessible or adequately analyzed previously. The chapters deal with: 1. General Introduction, 2. The Legal Regime of Territorial Waters, 3. The Legal Regime of Internal Sea Waters, 4. The Closed Sea, 5. The Legal Regime of the Continental Shelf, 6. The Legal Regime of the Deep Seabed, 7. The Legal Regime of the High Seas. It includes a Conclusion, a Selected Bibliography (about 272 references), a Table of Statutes and Orders, and a Table of Treaties. The book should be of interest to students of international law and Soviet foreign policy and particularly to those who will be concerned during the 1970's with further codification of the law-of-the-sea.

FTP

9.6 FISHING NEWS DIRECTORY & EQUIPMENT GUIDE

Anonymous
Arthur J. Heighway Publications Limited, Ludgate House, 110 Fleet Street, London EC4, England (Sales & Accounts Department, Mercury House, Waterloo Road, London SE1) £3 postpaid.

The 1971 edition of the subject directory is now available from the publisher. Its contents are as follows:

Vessels, owners, and builders (official list of UK fishing vessels of 25 tons and over; owners, managers, and vessels of individual fleets; number of vessels in all fishing ports of the United Kingdom; builders and their facilities; and fishing vessels recently completed, under construction, or on order).

Suppliers and manufacturers (propulsion, transmission, and steering; electronics and radio; chandlery and life-saving; catching and hauling; and marketing and processing).

Wholesale merchants at main ports.

Authorities and organizations.

General information (port-distinguishing letters; abbreviations used in the fishing industry; legal regulations for fish and shellfish; conversion table, degrees F. to degrees C.; conversion table, feet and fathoms to meters; editorial section).

Index.

LB

9.7 RESEARCH AND DEVELOPMENT -- WORLDWIDE
(0.9)

Research Management 14, No. 1, 12-74 (January 1971)

This issue of the journal is devoted to a current overview of the international research management scene. Most of the articles were drawn from a symposium held during the annual meeting of the International Research Institute in the Spring of 1970 in Boca Raton, Fla.

"How to Establish and Operate Multinational Labs," by Maurice Papo (IBM World Trade Corporation), pp. 12-19.

The success of an overseas operation depends in a critical manner to organizational structure and operating procedures that take into account cultural traits and customs of the country and its people.

"Effective Information and Technology Transfer in Multinational R&D," by B. V. Potter (ESSO Research and Engineering Services), pp. 20-27.

Prerequisites to fast and reliable communication with units abroad are standardization and a common technical language. Furthermore, resistances that develop at the interfaces between countries must be surmounted.

"R&D in Japan -- a Future That Will Challenge the U.S.," by Maurice Glicksman (Division of Engineering, Brown University), pp. 28-36.

Japan's R&D efforts in the past have not matched its rate of economic growth. Apparently this will change and Japan may become a world leader in innovative research. [2 references]

"R&D in Britain -- a Mix of Quality, Selectivity and Cooperation," by Lord Halsbury (Brunel University), pp. 38-46.

(over)

9.3 SCIENCE, POLICY AND THE DEVELOPING FRONTIERS OF INTERNATIONAL LAW
(9.2)

Goldie, L. F. E. (Naval War College, Newport, Rhode Island)
Akron Law Review 4, No. 1, 114-122 (Winter 1971)

Sciences are all-pervasive in international law and have a direct condition, if not determinative, effect both upon existing rules and upon progressive development of new rules. In this paper, the author discusses the impact of technological developments on international law. Specifically, the paper considers four topics: (1) International Weather Modification, (2) Space Activities and Nuclear Liability, (3) Man's Invasion of "Inner Space" (the volume and bed of the deep oceans), and (4) Nuclear Weapons.
[3 footnotes] FTP

9.7 (0.9)

The many differences in structure and operation of R&D in Britain and the United States may be owing to the great difference in per capita GNP between the two countries. [1 reference]

"Multinational R&D in Practice -- Two Case Studies," the first case study by W. T. Hanson, Jr. (Eastman Kodak Corporation), and the second case study by Rosemarie Van Runker (Chemagro Corporation), pp. 47-54.

The nature of a company's products determines the structure and operating principles of its foreign R&D organization.

"Organized Cooperative Research in Europe," by F. N. Woodward (Arthur D. Little Ltd.), pp. 55-63.

This article describes how European research associations designed to serve the broad R&D needs of an industry came into being, their purposes and functions, and how they are financed. [3 references]

"Management Styles and Philosophies Abroad," by Paramjit Singh (Cleveland Crane & Engineering), pp. 64-69.

The approach to solution of research management problems varies from country to country. Six countries are considered: Germany, France, Belgium, England, India, and Russia.

"Two International Research Organizations in Formative Stages," Anonymous, pp. 70-74.

This article describes the International Institute for the Management of Technology and a World Organization of Industrial and Technological Research that are being organized to advance management education and to promote cooperation between national industrial research organizations. [3 references] FTP

9.3 (9.19)(0.5)

Wild mammals (nutria, muskrat, racoon, rabbit, and the field mouse were examined) and birds (the rail and grebe were examined) appear to be the most likely sources of coliform and fecal coliform organisms in the soil and water samples from the unpolluted stations. The presence of coliform and fecal coliform organisms in the feces of wild mammals and birds must be considered as indicative of potentially dangerous pollution because salmonella organisms were also recovered from the feces of one racoon and one rail and from the soil frequented by wild animals. Therefore, in the evaluation of shellfish growing areas, the presence of warm-blooded wildlife in areas adjacent to the waters should be determined and an intensive study should be made to determine their influence on the bacterial quality of the shellfish and the waters. And, because salmonella might be present in waters having low coliform and fecal coliform bacteria counts, the bacteriological examinations should include not only coliform and fecal coliform organisms but also salmonella organisms.
[1 figure, 7 tables, 11 references] FTP

9.6 THIN-LAYER CHROMATOGRAPHY ABSTRACTS
(7.0)

Sutherland, I., and M. J. Saxby (editors)
Published by the Science & Technology Agency, 3 Dyers Buildings, London, E.C.1, England) Price £24 or $58.00

Volume 1, No. 1, January-February, covering abstracts 1-103 was just issued. This new international journal deals with the documentation of all aspects of thin-layer chromatography. It covers the world's major periodical literature, conference proceedings, and unpublished reports. It is issued bimonthly. The contents are grouped into seven sections--Methods: General; Methods: Technique; Methods: Apparatus; Biological Applications (Biochemistry and Medicine; Agriculture; Food; Fats and Oils); Industrial Applications (Chemicals; Petroleum Products; Metal Ions; Pollution); Geochemical Applications; and Miscellaneous. FTP

9.7 COMMUNICATING SPECIALIZED SCIENCE INFORMATION TO A LAY AUDIENCE

Funkhouser, G. Ray (College of Human Development, Pennsylvania State University), and Nathan Maccoby (Institute for Communication Research, Stanford University)
Journal of Communication 21, No. 1, 58-71 (March 1971)

Relatively little empirical research has been carried out on improving the communication of science information to laymen. In this article the authors report the results of an empirical, quasi-experimental study on textual variables in science writing and their effects on a lay audience. They found strong relationships between the textual variables readability and use of example and the audience variables information gain and attitude favorability toward the topic (the topic was enzymology).
[1 table, 12 references] FTP

9.3 FOOD REGULATIONS AND THE WORLD HUNGER PROBLEM
(9.2)

Parman, George K. (Agency for International Development, Washington, D.C.)
Chemical Engineering Progress Symposium Series 67, No. 108, 1-4 (1971)

The author discusses the need for uniform and technically sound national laws relative to foods and for competent administration and interpretation of such laws. Case examples involving fish protein concentrate and aflatoxins of various oilseeds are discussed. FTP

9.19 OCEAN POLLUTION AND MARINE WASTE DISPOSAL
(9.3)(9.2)

Anonymous
Chemical Engineering 78, No. 3, 60-67 (February 8, 1971)

Present practices of, the present and future problems related to, and the legal, technical, and economic constraints on the disposal of wastes in the marine environment are discussed in this Chemical Engineering staff report.
[2 figures, 3 tables, 10 references] FTP

9.12 RESPONSE OF BROOK TROUT (SALVELINUS FONTINALIS) POPULATIONS TO A FISHERY

Jensen, A. L. (Environmental Biology Branch, Division of Environmental Research and Development, Tennessee Valley Authority, Muscle Shoals, Ala. 35660)
Journal of the Fisheries Research Board of Canada 28, No. 3, 458-460 (March 1971)

Life tables were calculated for seven different brook trout populations (from data in the literature) and were used to examine the mechanisms that reestablish the balance of births and deaths upset by fishing. The analysis seemed to indicate that age-specific fecundity (the number of female eggs produced per female per year) is the compensatory mechanism in brook trout. Brook trout populations under heavy exploitation matured at an earlier age (than if lightly fished or unfished). Earlier, other workers had shown that the lower age-specific fecundity of a trout population of a lake was related to lower growth rate, and fecundity increases with increase in size of fish. The author suggests, therefore, that growth of the fish may indirectly be the most important variable in the adjustment of a fish population to a fishery [G. V. Nikolskii, "Theory of Fish Population Dynamics," Translated from Russian by J. E. S. Bradley, Oliver & Boyd Ltd., Edinburgh, Scotland (1969), 323 pp. made such a hypothesis earlier].
[1 table, 13 references] FTP

9.14 SATIATION TIME, APPETITE, AND MAXIMUM FOOD INTAKE OF SOCKEYE SALMON (ONCORHYNCHUS NERKA)

Brett, J. R. (Fisheries Research Board of Canada Biological Station, Nanaimo, British Columbia)
Journal of the Fisheries Research Board of Canada 28, No. 3, 409-415 (March 1971)

An assessment was made of the time required to reach satiation and the time sequence in the development of appetite in the feeding aspects of sockeye salmon. Such information would lead to a better insight of the question of maximum food intake and its relation to the size of sockeye salmon.

Apparently, size, itself, of the fish does not affect satiation time but does have a large influence on food intake. This conclusion, the author states, must be tempered in the perspective that reduced capacity to grow may be acting to inhibit larger daily intakes among older, larger fish. Therefore, the size-dependent rate of feeding and transforming energy might be simply a reflection of the size-dependent nature of growth rates.

Food is processed much faster by a biomass of many small fish than by an equal biomass of a few large fish (because of increased intake and some increase in processing rate). In terms of cropping, smaller members would be more effective harvesters (assuming the prey was equally available to any member within the size range).

In promoting the growth of sockeye salmon, the size of ration and presentation can be manipulated to maximize the daily intake. This can be done by taking advantage of the earliest point at which appetite is approaching a peak; this peak corresponds to a state of 90% evacuation of the stomachs in young sockeye.
[6 figures, 1 table, 23 references] FTP

9.17 (1.30) ORIFICE PLACEMENT IN GATEWELLS OF TURBINE INTAKES FOR BYPASSING JUVENILE FISH AROUND DAMS

Liscom, Kenneth L. (National Marine Fisheries Service, NOAA, 2725 Montlake Boulevard East, Seattle, Wash. 98102)
Transactions of the American Fisheries Society 100, No. 2, 319-324 (April 1971)

Four locations of an orifice within a turbine intake gatewell were tested to determine which was the most effective in facilitating the passage of fingerling Pacific salmon (Oncorhynchus spp.) and steelhead trout (Salmo gairdneri) from the gatewell into an adjoining trash sluice. The orifice positions tested with natural light were: (1) center of gatewell, 1.5-m. depth; (2) corner of gatewell, 1.5-m. depth; (3) center of gatewell, 4.6-m depth; and (4) corner of gatewell, 4.6-m depth. Hatchery-reared coho salmon (O. kisutch) placed in the gatewell and wild chinook salmon (O. tshawytscha) and steelhead trout that migrated downstream and entered the gatewell were used to evaluate response to different placements. The most effective location was in the corner of the gatewell at a depth of 1.5 meters. Changes from natural to artificial lighting did not improve passage. A darkened gatewell with artificial light over the orifice did affect passage efficiency, however, and should receive careful attention in any future application of a gatewell bypass system.
[4 figures, 3 tables, 7 references] Author's abstract

9.19 TOXICITY AND OXYGEN DEMAND OF DECAYING BARK

Servizi, James A., Dennis W. Martens, and Robert W. Gordon (Cultus Lake Laboratory, International Pacific Salmon Fisheries Commission, Cultus Lake, British Columbia, Canada)
Journal of Water Pollution Control Federation 43, No. 2, 278-292 (February 1971)

The purpose of this study was to determine, under laboratory conditions, the effects of new and old deposits of bark on eggs and alevins of sockeye salmon (Oncorhynchus nerka) incubating in gravel redds. The oxygen demand of the bark was measured, also, and the data were used to calculate the effect of bark deposits on oxygen levels in typical salmon redds.

The researchers found that the oxygen demand of bark is great enough and of such a prolonged nature as to create hazardous conditions in spawning grounds. Also, fine bark particles could possibly clog the gravel and cause mortalities of the eggs. The bacteria Sphaerotilus sp. could grow on bark and suffocate eggs and alevins (as a result of the filamentous nature of the bacteria). The authors estimated that bark concentrations of 4% or greater would likely increase mortality as a result of depletion of oxygen supplies at water velocities during incubation of the eggs of about 5 cm./hr., and bark concentrations of 1% or greater might retard emergence timing because of depletion of oxygen.

The authors suggest that the results should be applied to spawning grounds with care taking into account normal oxygen levels and temperature as significant factors. Furthermore, they recommend using a safety factor if the data are to be applied on a practical basis because hazards such as Sphaerotilus, H_2S, or other deleterious phenomena associated with bark but not detected in the laboratory may reduce survival. [7 figures, 10 tables, 23 references] FTP

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